In Table I are listed the results of cholesterol determinations upon the maternal bloods. These have been tabulated, within restricted ranges of cholesterol, in terms of mg. per 100 cc. In Table II are listed in similar manner the results obtained from determinations upon the infant bloods. The average of the 65 cases for the maternal blood is 222.7 mg. per 100 cc. For fetal blood, the average is 120.4 mg. per 100 cc.

In conclusion it can therefore be said that there is a far higher cholesterol content in maternal blood than in fetal blood at the conclusion of pregnancy. Even if the placenta transmits substances by simple diffusion,[15, 16, 17] it must also have a selective control over the passage of cholesterol from mother to fetus, or if the placenta is impermeable to cholesterol, it must be assumed that the fetus is able to synthesize in its own body a considerable amount of cholesterol.

7906 C

Duration of Estrus in Ovariectomized and Adrenal-Ovariectomized Rats Before and After Theelin.

FREDERICK E. EMERY AND EDWARD L. SCHWABE.

From the Department of Physiology, University of Buffalo.

Within the last few years numerous papers have appeared on several phases of the adrenal problem without adding, as Rogoff[1] has recently discussed, any very definite contribution. The literature on the sex-relationship has been especially confusing; and the many references cited by Kroc and Martin[2] indicate that total adrenalectomy may cause no change, a slight modification or complete inhibition of the estrus cycles. These authors made a point of the fact that the weight-loss of adrenalectomized rats must be restored before normal estrus is again established following injections of the cortical hormone. Yet this same result, as to normal estrus in adrenalectomized rats, may be obtained by allowing the animals to drink salt solutions (Kutz, *et al.*[3]).

15 Schlossman, *Der Stoffaustausch zwischen Mutter und Frucht durch die Placenta,* Munich, J. F. Bergmann, 1933.

16 Sinclair, *Am. J. Physiol.*, 1933, **103**, 73.

17 Masciotta and de Hoz, *Presse Med.*, 1933, **41**, 293.

1 Rogoff, J. M., *J. Am. Med. Assn.*, 1934, **103**, 1764.

2 Kroc, R. L., and Martin, S. J., *Am. J. Physiol.*, 1934, **108**, 438.

3 Kutz, R. L., *et al.*, PROC. SOC. EXP. BIOL. AND MED., 1934, **32**, 331.

This led us to study, by a different procedure, the theelin-inhibition problem previously reported.[4] The present approach has been first, to compare ovariectomized and adrenal-ovariectomized rats as to the estrus occurring on successive days following the operation; and second, the duration and reoccurrence of estrus that followed various doses of theelin. The estrus cycles were taken daily, by the pipette method, for 2 weeks or longer preceding and following the operation. Six to 10 days following the operation, all rats were placed on Ringer's solution as their only source of drinking water. A few animals died before the sixth day; but these are not considered in the data. All animals were autopsied. In 4 of the 60 rats composing the adrenal-ovariectomized group, adrenal fragments were found. Ovarian fragments were not seen in either group.

The per cent of rats in estrus each day for 10 days before and 12 days after ovariectomy (group O) is shown in Fig. 1; and similar results for adrenal-ovariectomized rats (group A-O) are found in Fig. 2. The 2 figures are almost identical in every way. Before operation, the per cent for group O averaged 45.1%, and for the A-O group 42.8%. These figures are slightly higher than the usual mean for our colony, but within the range of previous results.[4] The phase of the cycle at the time of operation seemed to have no bearing upon the post-operative effects.

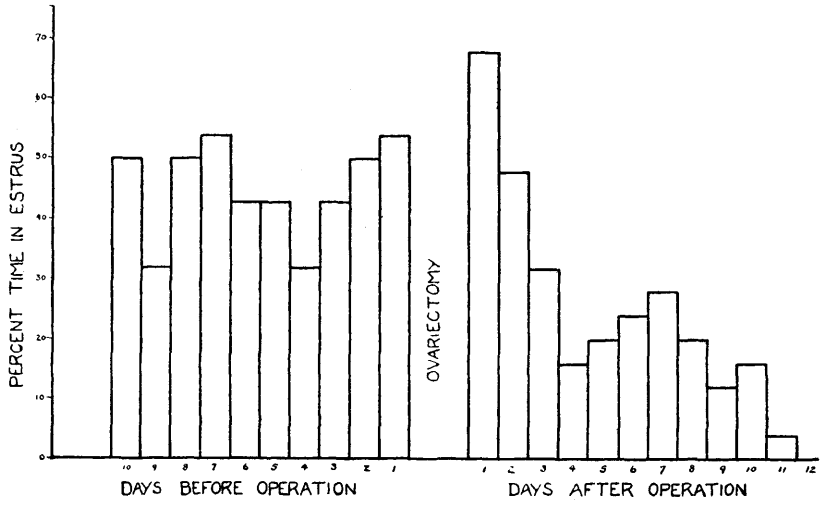

FIG. 1—Group O.
The per cent of rats in estrus each day for 10 days before and 12 days after ovariectomy. Data from 25 rats.

[4] Emery, F. E., *Anat. Rec.*, 1933, **57**, 315.

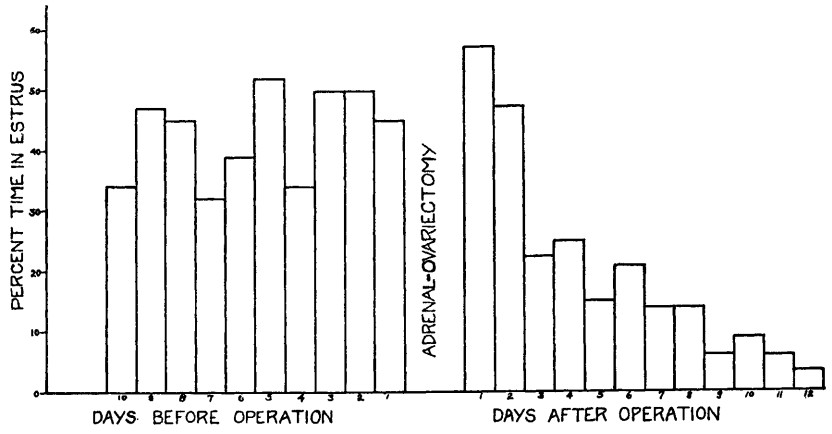

FIG. 2—Group A-O.
The per cent of rats in estrus each day for 10 days before and 12 days after adrenal-ovariectomy. Data from 40 rats.

It is interesting to note that the day following the operation more rats were in heat than on any other day. We were surprised to find so many estrus periods during the first 8 post-operative days in both groups; and especially, to note that the number in estrus on the sixth and seventh days was equal to or greater than those of the third day (Figs. 1 and 2). Even 12 to 15 days after total ovariectomy, estrus may occur. The intensity of the reaction is greatly diminished after the third day; and a vaginal smear of ++++ is seldom seen. We believe these results can be interpreted as estrous occurring on a lower level; but still maintaining some rhythm for 10 days or more after ovariectomy. Similar phenomena have been reported in the spontaneous activity of rats after ovariectomy.[5]

TABLE I.
Number of Rats in Estrus and Duration of Estrus in Days after Various Doses of Theelin in Ovariectomized and Adrenal-ovariectomized Animals.

	Theelin ½ R.U.			Theelin 1 to 5 R.U.			Theelin 6 to 10 R.U.		
Group	No. of rats	No. in estrus	Estrus reoccurred	No. of rats	Duration of estrus days	Estrus reoccurred	No. of rats	Duration of estrus days	Estrus reoccurred
A-O	16	4	none	19	2.1	4	12	2.2	3
O	16	3	"	19	1.8	2	24	2.3	5

A study of the data on theelin injections (Table I) shows that here again both groups reacted in a similar way. To facilitate the comparison, we have put the same number of rats in both groups, excepting the large dose of theelin, where a total of 12 and 24 are

[5] Hemmingsen, Axel M., *Skand. Arch. f. Physiol.*, 1933, **65**, 97.

considered. It will be seen that sub-minimal doses of theelin caused a reaction in 3 cases in group O and 4 cases in the A-O group. The duration of the estrus is the same in the 2 groups; as is also the number of cases where estrus reoccurred a few days after the first estrus.

Another series of 30 rats ovariectomized at weaning were divided 8 weeks later into 2 groups of 15 rats each. Bilateral adrenalectomy was performed on one group, and bilateral laparotomy on the other or control group. On the 2 days following operation, theelin was injected in 4 equal doses to a total of 2 R.U. In the adrenalectomized group 13 animals came into estrus, as compared to 11 in the control group. Thus the larger doses of theelin that are required to bring about estrus in ovariectomized rats of long standing are not reduced by adrenalectomy.

Summary. Total adrenalectomy in rats has little or no effect on (a) the estrus cycles that occur after ovariectomy; (b) reducing the minimal dose of theelin; (c) the duration of estrus following 1 to 10 R.U. of theelin; (d) the tendency for estrus to reoccur after a positive reaction to theelin; and (e) reducing the dose of theelin needed to produce estrus in ovariectomized rats of long standing.

7907 P

Depressor Action of Extracts of Burned Skin.

H. N. HARKINS, W. C. WILSON,* AND C. P. STEWART. (Introduced by Edmund Andrews.)

From the Departments of Surgery, Pharmacology, and Medical Chemistry, University of Edinburgh.

Extracts were made of normal and burned skin of rabbits by the method of Chang and Gaddum.[1] The skin was burned at temperatures varying from 70°C. to 210°C. and removed from 3 minutes to 48 hours after burning. The extracts were then tested by their action after intravenous injection on the blood pressure of 7 rabbits and 10 cats.

Results. Extracts of burned skin of 10 anesthetized rabbits caused an immediate, but transient, fall in blood pressure. The curve was similar to that following acetylcholine, but the recovery was slower

*Carnegie Research Fellow.

1 Chang, H. C., and Gaddum, J. H., *J. Physiol.*, 1933, **79**, 255.