that our results may be due to these secondary disturbances rather than the lack of our hypothetical factors. Nevertheless the evidence for the latter seems to us to be sufficiently strong to warrant a careful search, in the hope of adding some useful agents to our endocrine armamentarium.

Conclusion. The effects of prolonged daily administration of estrogenic substance to normal and to castrated adult female rats are compared. It is concluded that, in the rat, "estrin" alone cannot completely replace the ovary in the induction of the uterine changes of the estrus phenomenon. Our results indicate the existence of ovarian factors other than estrin (or progestin) which influence the estrus phenomenon in at least 3 respects: 1. Preliminary inhibition of the uterine response to estrin. 2. Rhythmic activity of the endometrium. 3. Augmentation of the uterine response to estrin.

9000 C

Effect of Administration of Parathyroid Extract on Serum Calcium Level in the Nephrectomized Rat.*

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Collip, Pugsley, Selye and Thomson[1] have observed resorption of bone in bilaterally nephrectomized rats which had been injected with massive doses of parathyroid extract. They are of the opinion that the primary action of parathyroid hormone is to cause an increased proliferation of osteoclasts, which actively function to release calcium from the bones to the blood. Since the observations of these workers were not supplemented by serum calcium determinations, which should yield evidence of the passage of calcium into the blood, we have carried out similar experiments† in which calcium analyses have been made.

* Aided by a grant from the Committee on Scientific Research of the American Medical Association.

1 Collip, J. B., Pugsley, L. I., Selye, H., and Thomson, D. L., *Brit. J. Exp. Path.*, 1934, **15**, 335.

† The incisors of the animals will be examined by Dr. Isaac Schour, and the femurs will be studied by Dr. F. A. McJunkin. Their findings will be reported in later communications.

Immature and mature rats of both sexes have been used. The animals (Table I) were not given food, but were supplied with water *ad libitum* during the 48-hour experimental period.‡ Parathyroid extract (Lilly)§ was injected immediately after nephrectomy, and successive doses were administered after 6, 12, and in some instances, 18 hours. Blood was obtained by cardiac puncture, without using an anesthetic, just before the animals were killed. Calcium analyses[2] were made by one of us (W.R.T.) on individual samples, which in most instances consisted of 2 cc. amounts of serum, and in no case less than 1 cc.

TABLE I.
Effect of Parathyroid Extract on the Serum Calcium Level in Normal and in Bilaterally Nephrectomized Rats.

Group	No. of Rats	Weight, gm.	Parathyroid Extract (Hanson)* units	Sacrificed after hrs.	Serum Calcium mg. per 100 cc.		
					Lowest	Highest	Average
			Normal Animals.				
A	12	86-141		48	9.36	12.52	11.14
B	5	94-122	250x2	48	13.92	16.68	15.05
	5	58-63	250x2	24	14.70	15.48	15.02
	2	227-245	250x3	48	12.87	16.68	14.78
			Nephrectomized Animals.				
C	14	62-287		48	8.72	11.93	10.53
D	6	98-127	250x4	48	10.48	13.64	12.09
	2	135-152	500x3	48	11.75	12.64	12.19
	3	152-269	250x4	48	8.95	11.32	10.18

*One "Hanson unit" is equivalent to one-fifth of a Parathormone (Collip) unit.

The data in Table I show that the serum calcium level in the normal rat (Group A) is well maintained during the first 2 days of starvation. After nephrectomy (Group C) the serum calcium level has a tendency to drop, and during the same period we have found in other work[3] that the serum inorganic phosphate increased rapidly. When the calcium values obtained in Groups B, C, and D are compared it is observed that in Group D there is only slight indication of mobilization of calcium as a result of parathyroid hormone administration. In no instance was definite hypercalcemia (values above

‡ The diet preceding the starvation period consisted of fox chow (commercial preparation) supplemented by cabbage, cheese, and lean meat once a week.

§ The authors are indebted to Eli Lilly and Company for the Parathyroid Extract used in these experiments.

2 The method is described by Tweedy, W. R., and Koch, F. C., *J. Lab. and Clin. Med.*, 1929, **14**, 747.

3 McJunkin, F. A., Tweedy, W. R., and Mednicky, W. J., *Arch. Path.*, 1934, **18**, 626.

15 mg. %) produced in a nephrectomized animal. Therefore it appears that the physiological changes which occur as a result of nephrectomy interfere with the mobilization of calcium into the blood.

9001 C

Further Evidence on Hormonal Basis of "Heat" Behavior.*

JOSEPHINE BALL. (Introduced by Carl G. Hartman.)

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In an exploratory experiment it was found that doses of 10 to 100 R.U. of estrin (Progynon-B Schering)† failed to have the slightest effect on the behavior of 3 hypophysectomized female rats, although similar amounts consistently brought castrated females into heat. This suggested that estrin produced heat behavior by way of the pituitary and led to a series of experiments which, while somewhat inconclusive, are, nevertheless, of interest because they seem to show that progestin is not the immediate heat behavior hormone in the rat as Dempsey, Hertz and Young[1] believe is the case in the guinea pig.

The same 7 castrated female rats were used in each experiment. The method of measuring varying degrees of sexual excitability has been described elsewhere.[2]

Injection of gonadotropic hormone (Prephysin Chappell)† in doses of 0.04 to 0.80 cc. had no effect, nor did luteinizing hormone† in doses ranging from 5 mg. given in a single injection up to 60 mg. given in 5 increasing doses over a 3-day period. However, 6 mg. of LH raised the sexual excitability of 2 unoperated females that happened to be spontaneously in a condition like that described as "constant estrus" by Witschi and Pfeiffer.[3] The latent period for

* This investigation was supported by a grant from the Committee for Research in Problems of Sex, National Research Council.

† Grateful acknowledgment is made to the Schering Corporation for the Progynon-B and Proluton used in these experiments; to Chappel Bros. for Prephysin; and to Dr. H. L. Fevold for luteinizing hormone.

1 Dempsey, E. W., Hertz, R., and Young, W. C., *Am. J. Physiol.*, 1936, **116**, 201.

2 Ball, J., *Comp. Psychol. Monogr.*, in press.

3 Witschi, E., and Pfeiffer, C. A., *Anat. Rec.*, 1935, **64**, 85.