to the method of Swingle and Pfiffner, upon the white blood cell count and the differential leucocyte count in normal rabbits. The normal white blood cell counts and differential counts in the rabbits were determined by studying the blood during 3 days prior to the injections of the extracts. The blood was taken from the ear vein at the same hour each morning to rule out, as much as possible, the diurnal variation in the leucocytes in the blood stream.

Twenty-four adult rabbits were studied in this experiment. Of these, 10 received 1 cc. of cortico-adrenal extract daily; 6 received 1 cc. of normal isotonic saline daily; 2 received 1 cc. of cortico-adrenal extract inactivated by heat; and 6 were normal untreated controls. The rabbits were injected intramuscularly for a period of 30 days. During the first 4 days after the beginning of the injections, complete white blood cell counts and differential leucocyte counts were done. From the fourth day to the completion of the experiment, the blood was studied at intervals of 4 days.

The experimental results show no change in the leucocytes in the blood after prolonged cortico-adrenal extract administration to normal adult rabbits. The white blood cell counts and the differential leucocyte counts were well within normal limits during the time of this experiment.

7849 P

Reaction of Ovaries of Mature Female Rats to Injections of Oestrin.*

J. M. WOLFE.

From the Department of Anatomy, Vanderbilt University School of Medicine, Nashville, Tenn.

Twenty-five mature female rats received daily injections of 200 rat units of a concentrated oestrus-inducing extract† for 8 to 15 days (a majority were for 12 days). Vaginal smears usually revealed a complete cornification of the vaginae for the first 3 to 5 days of the experiment which did not persist throughout the injection period except in 2 rats. At autopsy it was found that the

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† Progynon-B, described by the manufacturers, Schering Corporation, as a benzoic acid ester of dihydro-follicular hormone. A portion of this material was furnished gratuitously by Schering Corporation, Bloomfield, N. J.

ovaries of these rats presented a normal number of corpora lutea but that the corpora were greatly increased in size when compared with those of rats killed during the normal oestral cycle. They were, however, similar in appearance and size to the corpora lutea of rats killed during the latter half of pregnancy. The pituitary glands of the oestrin-injected rats were increased in weight. Their mean weight was 19.2 mg.; the range was from 12.5 to 27 mg., and all but 2 weighed above 15 mg. The mean pituitary weight of 143 normal cyclic female rats was 10.5 mg.

Serial sections of all ovaries and representative sections of the uteri and the vaginae were cut. For control material similar sections were made of the ovaries and the accessory organs of 30 female rats killed during the normal oestral cycle and from 25 rats killed during the latter half of pregnancy. The relative size of the corpora lutea in the various groups was obtained by measuring the 2 greatest diameters, in millimeters, of the sections of the corpora lutea with a micrometer eye-piece. The product of the 2 greatest diameters of the corpora was calculated and the average of the 5 greatest products thus obtained was considered as the size of the corpora lutea in the ovary.

Our results indicate that the corpora lutea present in the ovaries of rats receiving oestrin were definitely and consistently larger than those found in the ovaries of normal rats killed during the oestral cycle but that they are equal in size to those found in the ovaries of rats killed during the latter half of pregnancy. In the normal rats the mean product of the 2 diameters of the corpora lutea was 0.9 mm. The range was from 0.5 mm. to 1.4 mm. In 19 of the 30 rats used, this product was below 1 mm. In both the pregnant rats and those receiving oestrin, the mean products of the 2 diameters of the corpora were 2.6 mm. In both groups the extreme range was from 1 to 3.9 mm., but in 80% of the rats of both groups this product was between 2 and 3.9 mm. From these data it seems legitimate to conclude that injections of large amounts of oestrin into mature female rats induced a very marked increase in the size of the corpora lutea. Hisaw and his associates[1] have recently reported that oestrin stimulates the production of a luteinizing factor of the anterior hypophysis. Although we have approached the problem from another angle, our results confirm those of these investigators.

The vaginae of all the pregnant rats were mucified. In 3 exper-

[1] Hisaw, F. L., Fevold, H. L., Foster, M. A., and Hellbaum, A. A., *Anat. Rec.*, 1934, **60**, 52 (Supplement).

imental rats in which the corpora were not greatly increased in size the vaginae were cornified and in 5 rats which presented extremely large corpora lutea the vaginae were definitely mucified. In the rest of the experimental rats the vaginae were stratified, in some of these, there was some evidence of early mucification.

Detailed morphologic studies on the anterior pituitaries of these rats are incomplete. However, in the glands that we have studied the basophiles were reduced in relative percentage and those present were enlarged and devoid of granules. The eosinophiles were moderately reduced in percentage and many cells exhibited evidence of granular loss. The reduction in percentage and morphologic changes in the eosinophiles were most marked in those anterior lobes in which the weight increase was greatest. In previous reports we have invariably associated granular loss from the eosinophiles with the presence of active corpora lutea in the ovaries. The results presented in this paper confirm these previous findings.

7850 P

Production of a Collateral Circulation to the Heart.

C. S. BECK, V. L. TICHY AND A. R. MORITZ.

From the Laboratory of Surgical Research and the Institute of Pathology, Western Reserve University School of Medicine, Cleveland, Ohio.

The experiments recorded in this paper are to a large extent an outgrowth of work done previously.[1, 2] It was our purpose to destroy the normal coronary circulation and in its place provide an adequate collateral circulatory bed. This study, begun in February, 1932, is based upon 103 dogs in which attempts were made to produce a collateral circulation to the heart. The problem of producing a new blood supply to the heart resolved itself into 2 components, (1) to provide a vascular bed from which blood vessels could grow directly into the myocardium, (2) to reduce the circulation in the myocardium, so that collateral circulation in the adhesions might develop. The operative procedure was one of almost constant evolution. Omitting the details of development the procedure used was as follows:

[1] Hudson, C. L., Moritz, A. R., and Wearn, J. T., *J. Exp. Med.*, 1932, **56**, 919.

[2] Moritz, A. R., Hudson, C. L., and Orgain, E. S., *J. Exp. Med.*, 1932, **56**, 927.