

stain permits an easy identification of the polymorphonuclear neutrophils and counts may be made without difficulty.

Vaginal smears, obtained by means of a wire loop and clean cotton, were stained with Delafield's hemotoxylin. In making a polynuclear count, cells showing fragmentation or obvious distortion were omitted, the count including only cells possessing a distinct cytoplasmic outline.

It will be noted from Table I, a representative cycle, that the blood count is decidedly left-handed as compared to that of normal man, and that the vaginal smear count, while also decidedly left-handed as compared to man, is also somewhat right-handed when compared to the animal's own blood count. The average weighted mean of a group of 35 blood polynuclear counts is 1.09, with a standard error of ± 0.0016 , while the average weighted mean of a group of 20 vaginal polynuclear counts is 1.69, with a standard error of ± 0.039 .

The polynuclear count of the rat is similar to the polynuclear counts obtained by Simpson^{2, 3} from the cow, the sheep and the horse. Each of these animals presents the interesting condition, therefore, of having most of the polynuclear leucocytes of the blood fall into the first 2 classes of the polynuclear count.

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Effects of High Voltage Cathode Rays upon Germinal Epithelium of the Rat.*

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A study was made of the effects of high voltage cathode rays on the spermiogenic epithelium of the male adult white rat. The animals were about 5 months old, apparently healthy and virile. The shaved scrotal area was exposed in front of the anodal window of the Coolidge cathode ray tube to a current of one milliampere, at voltages of 200,000 and 250,000, about equally divided as to number of animals. All raying of more than one second duration was given in one second periods with about one-half second between each.

² Simpson, Ethel D., *Quar. J. Exp. Physiol.*, 1929, xix, 309.

³ Simpson, Ethel D., *Quar. J. Exp. Physiol.*, 1929, xix, 317.

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Tissues studied one to 50 days after raying.

Protocol of the experiments:

No. of rats	Time of exposure	Voltage
3	0.5 sec.	200,000
6	1.0 "	" "
8	5.0 "	" "
4	10.0 "	250,000
4	15.0 "	" "
3	20.0 "	" "
3	30.0 "	" "
6	normal controls	

The changes in the scrotal skin were similar to those in the abdominal skin as described previously by Jacobsen and Waddell,¹ and consisted chiefly of hyaline fusion of the collagen of the corium, acute necrosis of epidermal and hair follicle epithelium, with vascular changes as a much later occurrence.

Definite lesions were produced in the seminiferous tubules in a zone about 0.6 mm. in depth in the animals exposed for from 20 to 30 seconds, with proportionately shallower penetration in the animals exposed for shorter times. Pyknosis, fragmentation and karyolysis of nuclei, and depression of mitosis were seen in spermatogonia, spermatocytes, and spermatids, the Sertoli cells being least affected. The interstitial cells showed insignificant changes. The *tela subcutanea* below the upper 0.2 mm. of the skin and the *tunica vaginalis testis* showed no evidence of injury, indicating very clearly the much greater sensitivity of germinal epithelium to this form of radiation.

Alterations in the Golgi apparatus of the germinal cells were also observed, fragmentation, perinuclear arrangements and fusion with acrosomic material, changes corresponding with findings in the roentgen-rayed testis of *cavia cobaya* as reported by Gatenby and Wigoder.²

These observations, resembling as they do those made on roentgen-rayed testis, are offered as further biological evidence that the effects of roentgen rays are not due primarily to roentgen rays but to the electrons or cathode rays set free in the tissues.

¹ Jacobsen, V. C., and Waddell, K. C., *Arch. Path.*, 1928, v, 195.

² Gatenby, J. B., and Wigoder, S., *Proc. Roy. Soc.*, 1928, civ, 351.