

the extract. The negative results obtained with serum protein suggest either that these proteins may not be the substrate from which toxin is formed, or that some "x factor," in addition, is needed.

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The effects of radiation on calcium and phosphorus.*

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As a part of a problem on the effects of darkness and of radiation on the metabolism of normal dogs, we followed the balances and blood levels of calcium and phosphorus before and after radiation with a 25 ampere flaming arc, with a spectral energy distribution of approximately 50 per cent ultra violet, 11 per cent visible, and 39 per cent infra red. The animals were fed on a standard maintenance diet furnishing 70 calories per kilo body weight, and well balanced and complete in calcium and phosphorus. All the animals were on positive balances at the beginning of the experiments.

Under normal laboratory conditions there is a balance between the two constituents, a slight rise in serum phosphorus being accompanied by a similar decrease in the serum calcium, and vice versa. Radiation of one hour at 40 cms. (total energy equivalent to 55.44 gm. cal. per cm.²) for 8 days served to accentuate this balance, there being a marked increase in the phosphorus and a corresponding decrease in the calcium during the radiation, and a return to normal soon after the radiation was stopped. On repeated exposures of the same duration, however, both constituents show almost parallel curves, a rise in phosphorus being accompanied by a simultaneous increase in calcium. Single doses of two hours for 8 days on other dogs gave results similar to those obtained on repeated exposures. Grant and Gates¹ have reported similar findings in the rabbit.

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¹ Grant and Gates, PROC. SOC. EXP. BIOL. AND MED., 1925, **xxii**, 315.

Examination of the urine and feces shows that, although in some cases the actual amount of excretion is not markedly increased, the percentage found in the urine relative to the feces is always larger, indicating an increased absorption and retention of these constituents in the blood. Orr, Holt, Wilkins and Boone² and others have found similar effects on radiation in rickets and on diets deficient in calcium. Our results seem all the more significant since they were obtained on normal animals on complete diets, and suggest the possibility of stimulating balances, already positive, to optimum by radiation. In order to be able to make accurate comparisons, we have measured the radiation used spectrographically and spectroradiometrically, and express the dosage in absolute units.

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A brief note on the anatomy of the uterine opening of the Fallopian tube.

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A brief preliminary report¹ was recently made to call attention to the fact that in some of the laboratory animals it was always easy to inject from tube to uterus, whereas, when an injection was made in the reverse direction, the injection mass would pass more readily when the animal was found to be near the time of ovulation. Serial sections were made of the uterine opening of the Fallopian tube in the cat, dog, rabbit, rat, guinea pig, and pig. In all cases the opening of the tube was guarded by special folds, which, in the case of the pig, were easily visible in the gross after fixation. A single human specimen failed to show the folds. These special folds were free of glands in the case of the cat, rat, and pig; whereas in the dog a few glands were found. Furthermore, the stroma in these folds contained a large amount of connective tissue so that these structures were not flattened to the

² Orr, Holt, Wilkins and Boone, *Am. J. Dis. Child.*, 1924, xxviii, 574.

¹ Lee, F. C., *PROC. SOC. EXP. BIOL. AND MED.*, 1925, xxii, 335.