

B. aertryke not only is one hit by a 200 K.V. electron sufficient to kill, but every electron absorbed is lethal. The same is undoubtedly true of *Staphylococcus aureus*. (2) These data indicate that the only differences that exist in the resistance of these organisms to 200 K.V. electrons are due to their relative sizes. Since the physical phenomena consequent upon the absorption of an electron are, except for the additional charge borne by the electron, identical with those following the absorption of an X-ray quantum of equivalent energy, it is likely that the specific resistances of these cells to 200 K.V. X-rays can also be quantitatively explained by taking account of their relative sizes. Experiments to bear upon this question are being made with X-rays. (3) These results prove that measurements will lead to valid conclusions concerning the mechanism of the action of the radiation only when extraordinary care is taken to eliminate clumping of cells and to prevent multiplication before raying. These requirements have not been met by the experimental procedures commonly followed in X-ray and ultraviolet research upon bacteria.

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The Distribution of Ergosterol Administered to Rabbits.

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Rosenheim's¹ recently announced specific color reaction for ergosterol has been applied to the analysis of tissue from rabbits fed on "Vigantol" (irradiated ergosterol in oil).

The reaction as described by Rosenheim consists in the addition of a saturated aqueous solution of trichloroacetic acid to a chloroform solution of the sterol. There is every reason to believe this reaction quite specific for ergosterol or structurally related sterols. We have found after testing many solvents that dichloroethylene (low boiling) is a more satisfactory solvent for the reaction than chloroform. Using this solvent, quantitative estimations of the extracted, partially purified sterols may be made.

Ten adult rabbits were fed "Vigantol" with a stomach tube in doses ranging from 250-870 mg. of irradiated ergosterol. Four

¹ Rosenheim, Otto, *Biochem. J.*, 1929, xxiii, 47.

were used as controls. Practically all the animals showed the calcification phenomena now well described in the literature. The animals were killed and the organs dried in high vacuum, powdered, extracted with ether (dry), treated with saturated alcoholic barium hydroxide to remove soaps, extracted with petrol ether, the petrol ether evaporated and the residue taken up in dichloroethylene (1 cc.) and treated with one-half cc. of saturated aqueous trichloroacetic acid.

The results show a most striking accumulation of ergosterol in the adrenals and brain with small amounts in the liver and kidneys. Muscular organs appear to be almost free from this substance.

Judging from the color reaction the bone marrow especially seems to contain fairly large amount of a $\Delta^{1,2}$ sterin, the nature of which we are now investigating.

The results are all consistent but the amount of ergosterol found by the color test was not in proportion to the amount of ergosterol (Vigantol) fed, *e. g.*, the highest dosed animal did not have a great deal more ergosterol in his body. *A priori* one would of course expect this result.

Human arteriosclerotic aortas and adrenals from elderly patients showing arteriosclerosis contain a substance which strongly suggests by its color reactions and spectrogram the presence of ergosterol and its irradiation products whereas aortas from young individuals dying from varied causes seem to contain none or but traces of these materials.

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The Relation of Washed Granules From Commercial Vaccine to the Virus.

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The work of MacCallum and Oppenheimer¹ and of Craiciun and Oppenheimer² offered at least the hope that the "washed granules" prepared from commercial calf vaccine might represent purified vaccinia virus. We have accordingly investigated further the nature

¹ MacCallum, W. G., and Oppenheimer, E. H., *J. Am. Med. Assn.*, 1922, lxxviii, 410.

² Craiciun, E. C., and Oppenheimer, E. H., *J. Exp. Med.*, 1926, xliii, 815.