

vations continued for 2 hourly post-work controls. The 1st day of fasting there was no increase in excreted nitrogen during exercise. The 2nd day, there was some increase during exercise, a maximum increase on the 4th day, and, less each succeeding day, until there was no increase on the 8th, 9th and 10th days. The increased nitrogen, during the working period, continued during the post-work hours, *i. e.*, on the 4th day the preliminary period averaged 128 mg. of urinary nitrogen per hour, the exercise period 180 mg., and the post-work period 180 mg. After giving 500 grams of sucrose on the 11th day of fasting, exercise on the 12th day produced no increase in nitrogen metabolism.

Our insulin results indicate that the increased nitrogen excretion, after insulin, is correlated with the presence of carbohydrate reserves in the body rather than with a calling forth of reserve protein to counteract the insulin after the depletion of the carbohydrate stores. However, the exercise experiments show that muscular work can be accomplished without an increase in nitrogen excretion if sufficient carbohydrate is available. This is also the case after about 8 days of fasting and exercise. Exercise is accompanied by an increased protein metabolism during the early part of the fast.

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Experiments on Activation of Cholesterol Derivatives and Allied Sterols by Ultra-violet Irradiation.

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It has been shown repeatedly that cholesterol can be rendered antirachitic by subjection to ultra-violet rays. In a previous paper¹ it has been pointed out that "the saturated reduction products of cholesterol and phytosterol—dihydrocholesterol and dihydrophytosterol—were not activated by irradiation and did not acquire antirachitic properties." It was further shown that "cholesterol acetate, an unsaturated ester of cholesterol, developed antirachitic potency as the result of irradiation."² These results were "regarded as additional evidence that the double bond plays an essential rôle in activation." It has recently been shown by Rosenheim and Webster that in addition to the unsaturated carbon linkage of the

sterol molecule, the secondary alcohol group is intimately concerned in the activation by ultra-violet rays.³

The present communication concerns itself with the effect of irradiation on a large number of cholesterol derivatives prepared by one of us (Windaus). The following derivatives were tested: B-cholesterol, hetero-cholesterol, α -phytosterol; cholesteryl-chloride, cholesteryl-amin-acetate; cholesten, pseudo-cholesten, cholesterilen, cholestan-4-7 diol, cholestan 4-on 7-ol, cholestenon; stigmasterol, α -amyrol, cholesteryl-ether, cholesterol-dibromide, cholesterol-ozonide (non-irradiated and irradiated), apocholic acid.

These preparations were made with the idea of noting what rearrangement or substitution in the molecule could be made without interfering with the specific action of irradiation. Feeding tests on rats showed that none of these derivatives had acquired antirachitic potency. This result is of interest in view of the slight degree of deviation from cholesterol which has been made in some of the derivatives. Attention may be called in this connection particularly to B-cholesterol, in which there is a very slight rearrangement in the secondary alcohol, and the hetero-cholesterol, which is characterized by a shifting of the double bond. It is also of interest to note, that although it had been found previously by one of us, that cholesterol acetate, an unsaturated ester of cholesterol, developed antirachitic potency as the result of irradiation, the amin-acetate failed to become activated.

A detailed discussion of the significance of these tests of various cholesterol derivatives and allied sterols will be reported elsewhere.

¹ Hess, A. F., and Weinstock, M., *J. Biol. Chem.*, 1925, lxiv, 181.

² Hess, A. F., Weinstock, M., and Sherman, E., *J. Biol. Chem.*, 1926, lxxvii, 413.

³ Rosenheim, O., and Webster, T. A., *Biochem. J.*, 1926, xx, 537.

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The Anti-Bacterial Activity of Egg-White.

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The utilization of egg-white as pabulum by bacteria is a fact of common experience. Egg-white also possesses marked anti-bacter-