

blood calcium concentrations for the last three groups at autopsy were 12.7; 12.9, and 12.6 mg. per 100 ml. of serum as compared with an average of 11.9 mg. for 60 normal control rabbits. Rothman and Callenberg¹ have reported rises above normal in the blood calcium level following light baths.

These observations have been substantiated by the results of a second experiment in which a group of rabbits was given increasing exposures of ultra violet light daily over a period of four weeks. This group showed a relative increase of 32 per cent in the parathyroid weight over the normal figures and the blood calcium concentration rose from 11.9 mg. per 100 ml. of serum before exposure to 12.2 mg. on the twelfth day, 13.5 mg. on the twenty-second day, and 12.9 mg. at autopsy.

These preliminary experiments have served to relate the effect of ultra violet light on calcium metabolism to the parathyroid glands. Whether the light acts primarily on the absorption and excretion of calcium and causes a rise in the blood calcium which results in an hypertrophy of the parathyroid glands, or primarily affects the glands themselves, remains to be determined.

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Feeding experiments on rats with plants at different stages of development. Part II.¹

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This investigation was undertaken in order to ascertain the effect of supplementing a basal diet with dried samples of ungerminated, germinated and green corn. The object of the experiments was to see whether any growth-promoting substances were produced in the course of germination and "greening".

Experiments with ten groups of rats on diets: (1) regular (normal); (2) S + "A" + "B"; (3) S + "B"; (4) S + "A"; (5) S + "A" + ungerminated corn; (6) S + "B" + ungermi-

¹ Rothman and Callenberg, *Klin. Wchnschr*, 1923, ii, 1751.

¹ Harrow, B., and Krasnow, F., *J. Metabol. Research.*, 1922, ii, 401,

nated corn; (7) S + "A" + germinated corn; (8) S + "B" + germinated corn; (9) S + "A" + green corn; (10) S + "B" + green corn—were carried out simultaneously under such conditions as to make the results, from a comparative standpoint, suggestive. During the first month each group of rats (four to a cage) receiving either ungerminated, germinated or green material, was given 4 gm. of such material per day; during the second month this was increased to 8 gm. and during the third month to 12 gm. The results at the end of the first month showed that aside from the group on the "regular" diet (1) the one showing the most notable increase in weight is group 10 (synthetic + "B" (yeast) + green). Since neither 6 (synthetic + "B" + ungerminated) nor 8 (synthetic + "B" + germinated) shows corresponding gains, the most obvious explanation is that a "growth" of vitamin (A?) or an increase in the quantity present, has taken place during "greening". This view would fall in line with suggestions made by several workers in the field (for example, Drummond² and Wilson³). But another explanation offers itself as a result of the following experiment:

We carefully selected 100 seeds each of the ungerminated, germinated and seedling varieties and weighed them before and after air-drying, with the following results (weight in gm.):

	Fresh weight	Dry weight (room temp.)	Percentage dried material
Ungerminated	41.1	21.6	52.5
Germinated	46.2	24.1	52.1
Green	93.8	13.5	14.4

In our experiments, following the methods of other workers, we took the *same* quantities of the different varieties of *dried* material and compared results; whereas, it would seem, the more logical procedure would have been to take quantities in the proportion of 21.6, 24.1 and 13.5. In other words, instead of taking 4 g. ungerminated, 4 g. germinated and 4 g. green, we ought, perhaps, to take 4 ung., $4 \times 24.1/21.6$ germ (which is *about* the same) and $4 \times 13.5/21.6$ green. If this view be taken, then

² Drummond, J. C., *Biochem. J.*, 1921, xv, 530.

³ Wilson, J. W., *J. Biol. Chem.*, 1922, li, 455.

the rapid increase in weight noticed in Group 10 during the first month need not necessarily be interpreted as showing growth of vitamin; and the positive results claimed by other workers must be questioned. The results, of course, need not be interpreted as meaning that there is no growth of vitamin during germination and greening, but merely to suggest that the methods employed are open to criticism.

Groups 5, 7 and 9 receiving a diet which included "A" (cod liver oil) and one form of corn but no "B" (yeast) began to gain markedly over 6, 8 and 10 on a diet including "B" and one form of corn but no "A" from the sixth week on. It would seem, therefore, fairly obvious that, comparatively speaking, the seeds (ungerminated, germinated and green) are richer in vitamin "B"; for in 5, 7 and 9 whatever "B" the rats get must come from the corn, just as in 6, 8 and 10 whatever "A" they get must come from the corn.

We are now engaged in comparing (a) effect of equal weights of dry material with (b) effect of the same number of seeds (ungerminated, germinated and green) and (c) effect of using weights obtained from the ratios

$$4 : \frac{4 \times 24.1}{21.6} : \frac{4 \times 13.5}{21.6}$$

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Sulfur metabolism. III.

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The addition of cystine, cysteine or their derivatives to the control rations of rabbits caused a prompt and marked increase in the amount of sulfur eliminated in the urine. When these sulfur compounds were withdrawn the elimination of sulfur dropped to the control level, and in some instances even below this. This decrease in sulfur took place in the first two days of the period following the cystine sulfur feeding, and in most cases