The amount of glucose eliminated on the fourth day was 103.1 gm. By subtracting 33.55 gm., which originated from the protein (9.32 × 3.6), we find that 69.5 gm. of the 75 gm. of glucose fed, were eliminated unburnt. By applying similar calculations to the results obtained on the sixth and seventh days, we find that the protein metabolized during the sixth day yielded (7.18 × 3.6) 23.85 gm. of glucose, and during the seventh day (7.78 × 3.6) 28.01 gm. The total amount of glucose eliminated during these two days was 183.46 gm. By subtracting the glucose that was derived from the protein, we find that 131.6 gm. of the 150 gm. of glucose ingested were eliminated unburnt.

The nitrogen metabolism was diminished by a little more than 5 gm. on the fourth day and was reduced almost fifty per cent. on the sixth and seventh days. If the increase in the protein metabolism in phlorhizin diabetes were due to dynamogenetic reasons only, the burning of 5.5 gm. of glucose on the fourth day could not have spared the combustion of 31.8 gm. of protein. Nor could the burning of 18.4 gm. of glucose on the sixth and seventh days have spared as much as 81 gm. of protein.

From this experiment it is apparent that in phlorhizin diabetes, extra protein is catabolized in order to maintain the glucose concentration of the blood which, perhaps for some physico-chemical reason, is essential to the processes of life. The introduction of glucose into the system, although very little of it is burnt, spares that amount of protein.

It is also noteworthy in this experiment that the 150 gm. of glucose given within 12 hours were not eliminated completely during the first 24 hours, but were carried over to a great extent to the second 24 hours.

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## The influence of glutaric acid on phlorhizin diabetes.

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Baer and Blum found that the subcutaneous injection of 10 gm. of glutaric acid had the power of greatly reducing the amount of sugar and nitrogen in the urine of phlorhizinized dogs. The degree of reduction in the nitrogen elimination in most of their dogs is so marked (less than 1 gm. per 24 hours for dogs weighing 5.4 to 10.0 kilos!) that a repetition of this experiment seemed desirable.

Thanks to the kindness of Prof. Graham Lusk, I received 100 gm. of glutaric acid, which was prepared by Kahlbaum, and which enabled me to carry out the following research:

Dogs were phlorhizinized in the usual manner, and after establishing the D : N ratio, they received, subcutaneously, 10 gm. of glutaric acid dissolved in water and neutralized by means of $NaHCO_3$. The glutaric acid was administered in three equal doses during the course of the day.

*Dog No. 5.*

| Weight. | Total N. | Total Sugar. | D : N. | Remarks. |
|---|---|---|---|---|
| 12.7 | 18.02 | 60.96 | 3.38 | |
| 12.2 | 21.07 | 70.32 | 3.33 | 10 gm. glutaric acid. |
| 11.9 | 19.75 | 66.24 | 3.35 | |
| | | *Dog No. 7.* | | |
| 13.87 | 16.92 | 63.05 | 3.72 | |
| | 17.86 | 65.54 | 3.67 | 10 gm. glutaric acid. |

These results show that the glutaric acid, contrary to the findings of Baer and Blum, has no influence whatsoever either on the sugar or on the nitrogen elimination.

Another experiment was performed on a normal starving animal. It received 10 gm. of glutaric acid without showing any effect on the nitrogen elimination.

Baer and Blum report that a good many compounds containing two carboxyl groups possess the power of reducing the sugar and nitrogen elimination. Experiments are in progress to verify their contention.