occurs abruptly after a latent period of only a few seconds and is comparable in its intensity to that produced by adrenalin on the mesenteric or hepatic arteries. The duration is at least four hours, the limit of our means for recording it. Passing oxygen through it weakens this constricting property, as does time, *i. e.*, allowing it to stand one or two days at room temperature. Adrenalin added to blood serum even at the height of a contraction further increases it in the case of hepatic and mesenteric arteries, but produces an especially marked relaxation in the case of the coronary artery. Adrenalin added to fresh ox blood to make a proportion of one to 800,000, we have identified thirty-six hours later; and when added to make a proportion of one to 100,000 after seven hours' oxygenation under a pressure of more than 100 millimeters mercury at incubator temperature.

Sodium chloride in dilution less than .01 produces a marked constriction of the above-named arteries as compared with Ringer-Locke fluid. The latent period is longer than that of adrenalin or ox blood serum, the ascent more gradual; moreover the height of the curve seems to vary inversely to the sodium chloride water ratio to a point .005, below which we have not investigated. At .013 sodium chloride the strips of artery apparently die. The relations of calcium and potassium to tonus have not been taken up yet. Barium chloride produces a vasoconstriction which exceeds that produced by adrenalin, or, so far as our experience goes, any other substance. The curve produced by it tends to be irregular, frequently assuming a staircase character.

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The influence of the sugar concentration of the blood on the protein metabolism in phlorhizin diabetes.

By **A. I. RINGER.**

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According to Rubner, the protein metabolism of a normal starving animal is composed of two fractions:

I. Wear and tear quota.

II. Dynamogenetic quota.

The first fraction represents the protein metabolized in the life processes of the cells. The second fraction represents the protein burnt for the purpose of maintaining the temperature of the body.

Landergren, however, presents considerable evidence to show that the "dynamogenetic quota" of Rubner is really the result of two distinct processes:

I. The protein that is metabolized for the increased production of sugar, in cases where sugar is absent from the diet and the glycogen supply becomes low.

II. For the maintenance of body temperature.

It is a well-known fact, that in phlorhizin diabetes, the protein catabolism rises enormously; in some cases as high as five times the starvation requirements. Because of the renal origin of the glycosuria, there is a constant tendency for the concentration of the sugar in the blood to fall. The following experiment was performed in order to test what part, if any, the concentration of the sugar in the blood plays in the regulation of the protein metabolism.

A dog was phlorhizinized in the usual manner, and the D : N ratio established. Seventy-five grams of glucose dissolved in water and divided into six doses were given *per os* on the fourth day of the glycosuria. 150 grams were given on the sixth day.

The results are here tabulated:

Dog No. 11.

Date.	Period.	Weight.	Total N.	Total Sugar.	D : N.	Remarks.
February, 1912						
15″	III.	17.53	14.40	52.08	3.62	
16	IV.	17.24	9.32	103.10	11.06	75 gm. of glucose given per os.
17	V.	16.86	14.00	50.95	3.64	
18	VI.	16.60	7.18	127.17	17.71	150 gm. of glucose given per os.
19	VII.	16.25	7.78	56.29	7.23	
20	Animal died under anesthesia, while a sample of blood was being withdrawn from the carotid artery.					

From the D : N ratio on the third and fifth days, we may assume that the phlorhizin intoxication was complete and that the protein burnt on the fourth, sixth and seventh days yielded 3.6 gm. of glucose for every gram of nitrogen.

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