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The Rate of Excretion of Galactose.

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It has been shown in a previous paper[1] that the percentage of absorbed galactose that is excreted in the urine of the rat increases with increasing length of absorption, in spite of the fact that the rate of absorption remains constant from hour to hour. Thus in 1

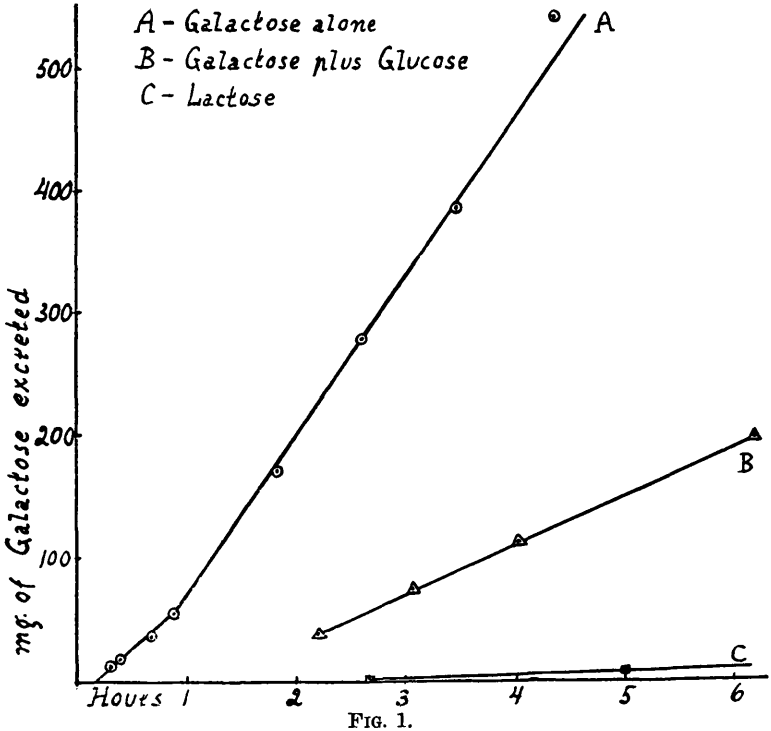

FIG. 1.

Rate of excretion of galactose, when galactose alone, galactose plus glucose, and lactose is fed.

TABLE I.
Galactose absorbed, utilized and excreted (in mg. per 100 gm. rat).

Galactose alone	1 hour	2 hours	3 hours	4 hours
Absorbed	182	364	546	728
Utilized	112	164	216	268
Excreted	70(50)	200(148)	330(279)	460(440)
% excreted	38.4(27.4)	55.0(41.0)	60.5(51.0)	63.2(60.5)

hour 27.4% appeared in the urine, in 2 hours 41%, in 3 hours 51%, and in 4 hours 60.5%. The present report is an attempt to elucidate the basis of this phenomenon.

Experimental. In figure 1 of the preceding paper the amounts of galactose excreted in the urine have been plotted against the amounts absorbed. The amounts excreted, as shown in this figure, can be plotted against time with the aid of the values recorded in Table I of the preceding paper, using 182 mg. per hour for the average rate of absorption of galactose alone, 74 mg. per hour for galactose from the galactose-glucose mixture, and 27 mg. per hour for galactose from lactose. This has been done in Fig. 1 of the present report. From Fig. 1 the values for excretion in Table I have been read off. It should be emphasized that these values are for an ideal excretion, since they have been obtained under experimental conditions which exclude a lag in sugar excretion. The values in parentheses, which are taken from a previous paper,[1] indicate how much galactose can actually be excreted during each hour. It will be noted that the percentage of absorbed galactose that is excreted in the urine increases from hour to hour. This makes it appear as if there were an hourly increment in the rate of excretion, and conversely an hourly decrement in the rate of utilization, but the phenomenon is actually due to a lower rate of excretion in the first hour, represented by a break in the straight line in Fig. 1. If one calculates the values from 0 to 1 hour, from 1 to 2 hours, and so on, one finds that after the first hour 52 mg. are utilized, and 130 mg. (or 71.4%) are excreted per hour for each consecutive hour. In other words the rate of excretion and utilization remains entirely constant after the first hour. The same consideration applies to the galactose-glucose mixture, except that the excretion and utilization do not attain a constant rate until the second hour. The values per hour after the second hour for galactose from the galactose-glucose mixture are 34 mg. utilized, and 40 mg. (or 57.1%) excreted. The lower rate of excretion in the first hour is due to the initial penetration of galactose into the tissues. The rate of excretion does not become con-

stant until the galactose concentration in the tissues and the blood has risen to a certain definite level. On account of differences in the rate of absorption this level is reached sooner and is higher when galactose is being absorbed alone than if galactose is being absorbed from the galactose-glucose mixture. These differences in the rate of absorption have an influence on the amount of galactose utilized per hour. The ratio in the rate of absorption is of the order 100:41. Of galactose when absorbed alone 52 mg. are utilized per hour; of galactose from the galactose-glucose mixture 34 mg. are utilized per hour. This bears out the fact already established for glucose (Woodyatt, Sansum and Wilder[2]) that for an increment in the rate of supply of sugar only a portion of the extra amount supplied is lost in the urine. In other words, the amount of galactose utilized per unit of time increases with increasing rates of absorption.

Summary. After the establishment of an initial equilibrium, due to the penetration of galactose into the tissues, the rate of excretion and utilization of galactose remains constant from hour to hour. The amount of galactose utilized per unit of time increases with increasing rates of absorption.

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Residual Reduction in Blood Filtrate After Treatment with Colon Bacillus.

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To 5 cc. portions of Folin-Wu filtrate were added 10 drops of a solution containing 6.4% NaH_2PO_4 and 17.9% Na_2HPO_4. These were then inoculated with a strain of an organism culturally and morphologically typical of *Bacillus coli communis*. After 24 to 48 hours incubation the residual reduction was determined by the technique of Folin and Wu[1] modified as follows: Several dilute standards ranging from an equivalent of 0 to 0.020% in terms of the original blood were treated in the same manner as, and simultaneously with, the unknown solution. The color of the latter was then compared directly without dilution and without the aid of a colori-