

elimination after viosterol increased very slightly as compared with its increase in the cat experiments. This may possibly be accounted for by the relative resistance of guinea pigs to viosterol spoken of by Taylor and his associates.⁵

An experiment in which viosterol was given to 4 guinea pigs for one week prior to, and during lead administration, was undertaken to determine primarily whether the viosterol would have any protective action against lead poisoning. It was thought that by promoting rapid elimination the danger of poisoning might be lessened. Although the number of animals was small the result of the experiment seemed to indicate quite definitely the opposite of any protective effect; death occurring in all 4 viosterol pigs more promptly than in the case of 10 out of 11 controls.

A comparison was made between the amounts of lead retained in the bodies of guinea pigs which had been given viosterol before and during lead administration and the lead in the bodies of pigs which had received lead alone. Two viosterol pigs showed a considerably greater retention of lead in their bodies after death than was shown by the controls and 2 showed less.

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Absorption Rates of Galactose and Mannose.*

G. E. BURGET, ROBERT LLOYD AND PHILIP MOORE.

From the Department of Physiology, University of Oregon Medical School.

The absorption rates of galactose and mannose were studied in rats and dogs using one hour as the absorption period. The rats were not fed during the 48 hours before being used but water was given as usual. One gram (2 cc. of a 50% sol.) of the sugar was given by stomach tube. Animals were killed by a blow on the head after which a ligature was tightly tied about the neck to prevent loss of sugar by mouth. The abdomen was then opened and ligatures placed about the oesophagus and lower end of ileum. This portion of the gastrointestinal tract was removed and the unabsorbed sugar washed out with warm water for quantity determinations.

⁵ Taylor, Weld, Branion and Kay, *Can. Med. Assn. J.*, 1931, **24**, 763.

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In using closed loops of ileum in dogs 2 gm. of the sugar were given (10 cc. of a 20% sol. introduced by needle and syringe). At the end of an hour the content was aspirated and the loop washed by injecting warm physiological salt solution and aspirating. More complete description of these procedures has been published.¹

Sugars of definite rotation (d-galactose + 80.5°, d-mannose + 14.25°) were used and concentrations made by weight were checked by polariscope. Galactose determinations were made by the Shaffer-Hartman method for determining glucose, consequently 10% had to be added to the findings to approximate the actual amount of galactose present. This method can not be used with any degree of accuracy for mannose estimations. A satisfactory method consists in reducing Benedict's qualitative solution and then plating the copper out and weighing the copper electrodes.²

The results are shown in Table I. While there is some difference in the comparative rates at which these 2 sugars were taken up by dogs and rats, the findings would seem to justify the conclusion that galactose is absorbed approximately twice as fast as mannose.

Using similar methods we have reported the relative rates of absorption of d-glucose and d-fructose.¹ Cori³ investigated the

TABLE I.

Absorption of galactose and mannose in gms. in different animals. 10 cc. of 20% solution of sugar used in the dog closed loops. 2 cc. of 50% sugar solution in the rat alimentary tracts. Time of absorption, one hour. Rat weight limits 140-240 gm. Average 168 gm.

Closed Loops (Dogs)		Gastrointestinal Tracts (Rats)		
Galactose	Mannose	Galactose	Mannose	
1.02	.45	.69	.33	.40
0.91	.56	.64	.35	.35
0.93	.43	.55	.40	.24
0.83	.57	.78	.38	.47
0.91	.30	.68	.37	.27
0.83	.36	.70	.25	.22
0.72	.43	.61	.33	.46
1.10	.36	.54	.30	.48
1.06	.56	.59	.28	.45
1.00	.24	.67	.36	.30
0.84	.31	.47	.43	.23
0.88	.32	.63	.45	.26
0.95	.43		.44	
0.88	.56		.37	
1.02			.28	
0.93			.38	
0.93			.40	
Average 0.93	.42	.63	.35	

¹ Burget, G. E., Moore, P., and Lloyd, R., *Am. J. Physiol.*, 1932, **101**, 565.

² Moore, P., Lloyd, R., and Burget, G. E., *J. Biol. Chem.*, 1932, **97**, 345.

³ Cori, C. F., *J. Biol. Chem.*, 1925, **66**, 691.

TABLE II.
Comparison of the rates of absorption of hexoses (glucose = 100).
Absorption time, 1 hr.

Sugar	Rats	Closed loops (dogs)
d-galactose	115	108
d-glucose	100	100
d-fructose	91	92
d-mannose	64	49

rates of absorption of these 4 sugars in rats. On the basis that glucose = 100, he states the absorption rate of galactose as 110, fructose 43 and mannose 19. On this basis (glucose = 100) our findings are summarized in Table 2. There are probably 2 factors that enter into this difference of results, namely, the number of experiments necessary in this type of work to allow one to arrive at a dependable average and the method necessary to accurately estimate small quantities of mannose.² While the Shaffer-Hartman method for glucose determinations may be applied to levulose and galactose since the error remains fairly uniform throughout the range of concentrations used, no uniformity was found when applying it to mannose determinations.

The marked difference in reaction of glucose and mannose to a common reagent emphasizes the importance of their stereoisomerism and at once suggests this as the probable factor in the difference in absorption rates rather than the so-called "selectivity" (preference for glucose) on the part of the intestinal mucosa.

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The Head Pattern in *Amblystoma* Studied by Vital Staining and Transplantation Methods.

ESTHER CARPENTER. (Introduced by Ross G. Harrison.)

From the Osborn Zoological Laboratories, Yale University.

Local vital stains were applied to the prospective head region in the late yolk plug stage of *Amblystoma punctatum* by Vogt's¹ method. From the records obtained by making camera lucida drawings of the position and extent of the stained areas in the stages following, composite diagrams were constructed showing the arrangement of the parts of the prospective ectoderm involved in the

¹ Vogt, *Arch. f. Ent. d. Org.*, 1925, 106.