A typical estrus endometrium was associated with follicle stimulation whereas a pseudopregnant development was obtained in the presence of lutein tissue in the ovary. However, regression from the pseudopregnant phase was observed 16 days after the last injection.

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Xylose as a Cataractogenic Agent.*

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Mitchell and Dodge first reported the occurrence of cataract in rats fed rations containing large quantities of lactose.[1] It appears probable that the galactose portion of the lactose molecule was the causative agent.[2, 3, 4] It has been stated that galactose is a unique causative agent in the experimental production of lens opacities in the rat.[5] Other carbohydrates which have been adequately investigated for possible cataractogenic activity are glucose and fructose and substances which yield only these 2 monosaccharides upon hydrolysis. We have therefore undertaken the investigation of other less common monosaccharides with respect to this property.

Rats weighing 32-47 g and 21-22 days of age were given diets consisting of 18% casein, 3% salt mixture, 2% cod liver oil, 6% butter fat, 10% dried yeast, 26% cornstarch, and 35% monosaccharide. Glucose, galactose, and xylose were used in this series. The C. P. galactose was obtained from Pfanstiehl Chemical Co. Two lots of xylose were used; the technical grade (Pfanstiehl) was used in the diets of 12 rats and a sample of C. P. xylose (Pfanstiehl) was given to 4 rats. Five litters of rats were used, 2 from a Wistar strain of albinos and 3 from a strain of black and white

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1 Mitchell, H. S., and Dodge, W. M., *J. Nutrition*, 1935, **9**, 37.

2 Yudkin, A. M., and Arnold, C. H., PROC. SOC. EXP. BIOL. AND MED., 1935, **32**, 836.

3 Mitchell, H. S., PROC. SOC. EXP. BIOL. AND MED., 1935, **32**, 971.

4 Day, Paul L., *J. Nutrition*, 1936, **12**, 395.

5 Mitchell, H. S., Cook, G. M., and Merriam, O. A., *J. Nutrition*, 1937, **13** (supplement), 18.

TABLE I.
Incidence of Cataract in Rats Fed Adequate Diets Containing 35% of Various Sugars.

Sugar fed	No. of rats	No. showing cataract	Avg time of appearance of cataract, days
Glucose	7	0	—
Xylose	16	16	4.2
Galactose	6	6	5.7

hooded rats. Some of the rats from each litter received glucose, others received galactose, and still others received xylose. Daily ophthalmoscopic examinations were made after dilating the pupil with 0.5% atropine sulfate solution. Slit-lamp examinations of the eyes were also made.

All of the rats fed either xylose or galactose developed cataract, while none of those receiving glucose developed lenticular changes. The results are presented in Table I. The time of appearance tabulated is for the earliest changes observable with the ophthalmoscope. Eight of the xylose-fed rats developed mature cataracts in from 14 to 26 days. Four of the galactose-fed animals developed mature cataracts in from 18 to 24 days. The others of both groups were killed for histologic study before the opacities were complete. In all of the animals fed xylose the first opacities were subcapsular, either in the equatorial region or in the posterior cortex. The nucleus was seldom involved. The opacities were not transitory since they persisted after the rats were returned to a normal stock diet. No appreciable difference in the response of animals to the 2 grades of xylose has been noted.

Blood sugar data will be presented in a later report. The average blood sugar level in rats receiving xylose was higher than the average in litter mates receiving glucose but lower than that in animals fed galactose. This suggests that the ability of a carbohydrate to raise the blood sugar level may not be the only factor determining its injurious action on lens tissue. Since galactose and xylose have certain configurations in common, it is conceivable that this injurious action may be a property of a number of sugars with particular configurations.

Summary. Young rats given a diet containing 35% xylose developed cataractous changes within approximately the same length of time as did litter mates receiving a similar diet containing 35% galactose. Controls receiving glucose showed no lenticular changes. It is suggested that the cataractogenic activity of sugars may be dependent upon certain molecular configurations.