

## 4008

**The Grading of Collodion Membranes by Means of Ethylene Glycol.**

ADA M. FIELD AND ARTHUR W. THOMAS.

*From the Department of Chemistry, Columbia University.*

In the ethylene glycol method of grading collodion membranes<sup>1</sup> the grading is brought about not, as Pierce supposed, by ethylene glycol alone but by ethylene glycol plus the alcohol retained in the membranes after 24 hours drying.

Ethyl alcohol is readily absorbed both by ethylene glycol and by calcium chloride, therefore the amount of alcohol retained by the membrane is determined in part by the per cent of glycol in the collodion solution employed, and in part by (1) the quality of calcium chloride used in the outlet from the drying chamber and (2) the accessibility of this chloride to the alcohol vapors from the chamber. By varying the diameter of the opening between the floor of the drying chamber and the container of calcium chloride, wide variations were produced in the "weight before washing" and in the "wet weight" of membranes prepared from collodion solution of the same ethylene glycol content, while with the calcium chloride constant in all respects the grading by means of ethylene glycol was good.

## 4009

**Experimental Ulcer of the Colon in Rats.**

W. M. BALDWIN.

*From the Department of Anatomy, Albany Medical College.*

This work is part of a series of experiments to determine whether subcutaneous injections of Mercurochrome-220 Soluble (Hynson, Westcott and Dunning, Baltimore, Md., U. S. A.) rendered adult white rats more susceptible to the lethal effects of X-ray energy. On alternate days, 1.0 to 2.0 cc. of a 0.5% solution in normal saline was injected into the dorsal subcutaneous tissue of 12 adult rats, all of the same size. Different areas were selected for the successive injections to avoid a possible necrosis of the tissues from too concentrated and prolonged action of the stain. Thus each rat received

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<sup>1</sup> Pierce, H. F., *J. Biol. Chem.*, 1927, lxxv, 795.

a total of from 6.0 cc. to 8.0 cc. of this solution. Upon the 4th day, there was noticeable a distinct reddish tinge to the skin, ears, eyes, mucous membranes, and to the feces and urine as well. All of the animals were killed after the 4th injection; *i. e.*, 7 days after the beginning of the experiment.

At autopsy, the connective tissues, fat, blood, skin and various organs of the digestive tract and of the urinary tract were distinctly stained with the dye, as has been reported by other investigators.<sup>1</sup>

Upon microscopic examination, the kidneys presented histologic changes more marked in the glomeruli and in the cells lining the convoluted tubules. The vessels of the glomeruli and of the adjacent portions of the tubules were distended and filled with deeply stained red blood cells. The columnar lining of the convoluted tubules presented various stages of cloudy swelling, necrosis, and exfoliation. The most interesting and most constant of the histologic findings were referable, however, to the cecum and ascending colon.

Young and Hill<sup>1</sup> have reported colitis and enteritis present in animals receiving intravenous therapy, and, likewise, Todd<sup>2</sup> has recognized a form of catarrhal colitis. Such findings have been verified by this experiment. And, in addition, a constant ulcer was identified upon the median wall of the ascending colon, directly cephalad to the ileocecal valve. This ulcer was circular in outline, averaging from 3.0 to 5.0 mm. in diameter, with a depth varying from a superficial erosion, involving epithelium alone, to more extensive necrosis comprising both mucosa and submucosa, and with a base formed by the circular muscle fibers of the gut wall. In no instance were these muscle fibers involved in the ulcer. The ulcer crater was filled with clotted blood, tissue detritus and intestinal content, all deeply stained with mercurochrome. The edges of the ulcer were sharply defined and presented some degree of edema with cellular infiltration of the adjacent tissues. Various stages of degeneration and necrosis of these tissues, dilated capillaries choked with stained red cells and a certain degree of leukocytosis constituted the readily recognizable essential features.

The constant location of this ulcer is the most significant single feature of the histologic findings and has been hitherto unreported.

Evidence has been presented by the authors above cited that mercurochrome is excreted through the colon mucosa. While it is possible to imagine that the excretion of a considerable amount of

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<sup>1</sup> Young and Hill, *Arch. Pediat.*, 1927, xliv, 152.

<sup>2</sup> Todd, *Lancet*, November 14, 1925.

this drug in sufficient concentration might be the direct cause of the primary irritation which subsequently resulted in a necrosis of the mucosal lining, it is difficult to conceive of a sharp restriction of this excretory function to only those cells of the colon mucosa which occupy the position of the ulcer. No other colon ulcer was found in this series. On the other hand, it is not unreasonable to assume that mercurochrome is excreted through the small intestine mucosa even though the experimental evidence for this feature is difficult to obtain. Certainly the enteritis which has been reported by Young and Hill is explicable upon this basis. Assuming that a certain amount of mercurochrome well diluted is excreted through the small intestine mucosa, the rapid absorption of fluid from this intestinal content upon arrival and stasis in the caecum might well increase the concentration of the chemical to the degree that its corrosive action becomes manifest upon that portion of the colon mucosa where that concentration is greatest. This is the only hypothesis which appears plausible to the mind of the author.

#### 4010

##### **Response of High Protein Diets and Unilateral Nephrectomy During Reproduction in the Rat.\***

HELEN T. PARSONS,† ARTHUR H. SMITH AND T. S. MOISE.

*From the Laboratory of Physiological Chemistry and the Department of Surgery, Yale University.*

This study was undertaken to determine the extent to which the task of excretion of nitrogenous katabolites could be intensified in the organism by simultaneous reduction of kidney tissue, reproduction with lactation and high protein intake and to observe the physiological adjustments made to these conditions. Unilateral nephrectomy was performed on adult female rats which were placed immediately on the experimental rations and, as soon as the regular oestrous cycle was reestablished, were mated. The weight of the litters at birth and at weaning were compared and lactation closely observed during this time. Some of the mother rats were killed

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† Mary Pemberton Nourse Fellow of the American Association of University Women.