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Emptying of the Gall Bladder in Monkeys.

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It has been clearly shown that in certain species of mammals, such as the opossum[1] and the rabbit,[2] there is little if any emptying of the gall bladder after meals, although Walsh reports that partial evacuation in the rabbit may be induced by cholecystokinin.[3]

It is of especial interest, therefore, to ascertain the rate of emptying of the gall bladder in animals nearest man. Through the courtesy of Dr. J. C. McKinley, 5 specimens of *Macacus rhesus* were made available for study, and the gall bladder of each visualized: first, by intravenous injection of tetraiodophenolphthalein, and afterwards, by direct introduction of lipiodol at the time of laparotomy.

Two of the animals (both of them females) failed to exhibit shadows after the Graham test and failed, subsequently, to empty the lipiodol after a meal of egg yolk. In one of these there was a supracolic peritonitis. In the other, as revealed by serial sections, there was a subacute or chronic cholecystitis with marked infiltration of plasma cells and lymphocytes, but with intact epithelium. This condition is of value as indicating what degree of inflammation is sufficient to prevent concentration of the dye.

In the remaining 3 animals (all males) the gall bladder was readily visualized and exhibited rapid evacuation of bile after a meal of egg yolk. The first one emptied half of its contents in the first 36 minutes (Graham method); the second one, ¾ of its contents in 24 minutes (Graham method), and all of its lipiodol in 32 minutes;

[1] DuBois, F. S., and Hunt, E. A., *Anat. Rec.*, 1932, **52**, 11 (Supplement).

[2] Thompson, F. R., *Master's Thesis, Univ. of Minn.*, 1932.

[3] Walsh, E. L., *Proc. Am. Physiol. Soc.*, 1932, **101**.

the third one evacuated most of its lipiodol in 27 minutes and disposed of the rest within the next 19 minutes. Nothing comparable to this initial rate of emptying has been found in any other species except man[4] and definitely establishes the supremacy of the primate gall bladder.

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Alterations of Protein Distribution Between Corpuscles and Plasma by Isotonic and Hypertonic Solutions.

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One of us (Scott[1]) observed that upon the addition of isotonic saline to whole blood *in vitro,* the total protein of the plasma was greater than in the original plasma; in other words, some protein had entered the plasma from the corpuscles. We have repeated these experiments and confirmed the observations as regards isotonic solutions, but when hypertonic solutions are used, the reverse occurs; there is a decrease in the total plasma protein, indicating that some protein had entered the corpuscles from the plasma. When hypertonic solutions were added to plasma alone, a decrease of protein did not occur, the total protein in the diluted specimen corresponding to the total in the control. Whether isotonic or hypertonic solutions were added to blood, the non-protein nitrogen of the plasma invariably increased.

The principle used was that employed by Scott. The corpuscle and plasma percentages were determined in duplicate by the hematocrit. The nitrogen determinations were made in duplicate by the modified micro-Kjeldahl method of Cavett,[2] including the use of H_2O_2[3] to complete the oxidation. 0.8 cc. of plasma was used for the total nitrogen determination and what would be equivalent to 2.5 cc. of plasma for the non-protein nitrogen, the protein-free filtrate being prepared according to the tungstic acid precipitation of Folin and Wu.[4] Duplicate blanks were run in all the determinations.

[4] Boyden, E. A., *Anat. Rec.,* 1928, **40**, 147.

[1] Scott, F. H., *J. Physiol.,* 1915, **50**, 128.

[2] Cavett, J. W., *J. Lab. Clin. Med.,* 1931, **17**, 79.

[3] Koch, F. C., and McMeekin, T. L., *J. Am. Chem. Soc.,* 1924, **56**, 2066.

[4] Folin, O., and Wu, H., *J. Biol. Chem.,* 1919, **81**, 38.