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**Effect of Liver Autolysis in Vivo.\***

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It has been concluded by Mason, Davidson, *et al.*,<sup>1</sup> that aseptic autolysis of the animal's own liver placed in the free peritoneal cavity, under aseptic conditions, causes death of the animal in 15 to 18 hours. This work has been repeated by Wangensteen and Waldron,<sup>2</sup> with essentially the same conclusions.

In our first series of experiments the blood supply to the small lobe of the liver to the left of the gallbladder was ligated, and the liver left *in situ*. Careful aseptic technique was practiced. All of these animals died in 12 to 20 hours. Blood chemical studies were made of the non-protein nitrogen, the urea nitrogen, and the whole blood chlorides. No significant changes were noted in the blood chemistry. At autopsy the ligated lobe of liver was always gray-brown friable, necrotic, and often contained gas. In only one instance was a culture of the liver made at post-mortem. A Gram positive, spore bearing, anaerobic organism was obtained.

In a second series of experiments the entire liver of an animal was removed under aseptic technique, and pieces carefully cultured. All cultures of fresh liver were positive for a Gram positive anaerobic bacterium, except in 2 instances. Such fresh liver was placed, using careful aseptic technique, either into the peritoneal cavity, or between the muscles of the abdominal wall of other animals. Death of the animals followed in 18 to 30 hours. At autopsy the liver was gray-brown, necrotic, friable, and gas-containing. Anaerobic bacteria were present in all cultures of the liver. Chemical blood studies revealed no significant change.

The autolytic enzymes of fresh liver were destroyed by heating to a temperature of 75°-80° C. for 15 to 20 minutes. A Gram positive anaerobic organism was cultured from the liver after heating. Placing such liver into the abdominal wall or into the peritoneal cavity caused death of the animals in 24 to 36 hours. The anaerobic organism was identified at post-mortem. The liver at post-mortem was firm, gray-brown and smooth.

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\* This work has been conducted under a grant from the Douglas Smith Foundation for Medical Research of the University of Chicago.

<sup>1</sup> Mason, Davidson, Mathews, and Rastello, *J. Lab. and Clin. Med.*, 1924, x, 622.

<sup>2</sup> Wangensteen, O. H., and Waldron, G. W., *Arch. Surg.*, 1928, xvii, 430.

Liver that had been autoclaved at a pressure of 15 pounds for 15 minutes was sterile. Pieces of such liver were placed into the peritoneal cavity of other animals without causing death. Some of such autoclaved liver was reinfected by organisms isolated in pure culture from fresh liver. Such a piece free in the peritoneal cavity or abdominal wall caused the death of the animals within 24 hours.

Foetal liver, secured aseptically from cesarean section pups was proven sterile by culture. When placed into the peritoneal cavity of other animals it was autolyzed completely without injury to the animals.

*Conclusions.* (1) The uncontaminated liver of normal healthy adult dogs regularly contains anaerobic bacteria. (2) It is probable that the experimental so-called "*In Vivo* aseptic autolysis of the liver," is always complicated by this infection, and that this is the cause of death. (3) *In vivo*, aseptic autolysis of fetal liver (proved sterile by culture) does not produce toxic effect. (4) Autolytic enzymes of liver may be destroyed by heating, but such pieces of liver cause the death of an animal in 24 to 36 hours. An anaerobic, spore-bearing bacterium may be recovered from the liver at autopsy. (5) Autoclaved liver is sterile, and causes no harm to an animal if placed into the peritoneal cavity. If autoclaved liver is re-infected with the anaerobic organisms before being placed into the peritoneal cavity, or abdominal wall, death results within 24 hours.

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### Fatal Effect of Total Loss of Gastric Juice.\*

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The present experiments were undertaken to determine the effect of the total loss of gastric juice from the body under conditions not complicated by obstruction such as are present after closure of the pylorus. Recourse was made to a method described by Lim, Ivy, and McCarthy<sup>1</sup> with this important modification that the vagus nerves to the isolated stomach were left intact. The stomach was cut across at the cardia and the pylorus. The cardiac end of the

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\* This work has been conducted under a grant from the Douglas Smith Foundation for Medical Research of the University of Chicago.

<sup>1</sup> Lim, Ivy, and McCarthy, *Quar. J. Exp. Physiol.*, 1925, xv, 13.