It appears then that vitamin D in the form of viosterol produces an increase in the metabolic rate in the normal rat similar to that previously reported for normal dogs.

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Acid and Enzyme Content of Postoperative Emesis as Indication of Regurgitation from the Duodenum.

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The lack of knowledge concerning the cause of the nausea and vomiting which follows surgical operation prompted these studies. We have examined 115 specimens of postoperative vomitus from 62 cases chosen at random to include anesthetics and operations of many types. Over half had had ether either alone or in combination with other anesthetics. These factors seemed to bear no relationship to the results tabulated below.

No free acid	95	specimens
0 to 20° free acid	9	"
20 to 40° free acid	4	"
40 to 60° free acid	4	"
80° or more free acid	3	"
Total	115	"

Cushing[1] has recently called attention to a possible nervous mechanism in the production of peptic ulcer. In this connection it is interesting to note that of 11 specimens with an acidity over 20, 7 were obtained following operations for brain tumors. This observation might be explained by Cushing's postulation of a center in the cerebrum which is capable of promoting gastric secretion.

Not only the cases that actually vomit have this anacidity. Postoperative aspiration was done by nasal catheter in 15 patients. In these specimens there was no free acid. This lack of acid is not accompanied by a corresponding lack of enzymes. In all cases where free acid was present peptic activity was present, and in most of the cases (91 of 115) where the acid was absent peptic activity was detected after acidification with 0.4% hydrochloric acid. Rennin was present in 80 of 115 specimens.

[1] Cushing, H. K., *Surg. Gynec. and Obst.*, 1932, **55**, 1.

Evidence of duodenal regurgitation is present as witnessed by the fact that of 115 cases, only 57 had bile in the stomach, while a considerably greater number contained pepsin but were not acid. Specimens from 75 cases were found to contain trypsin. Twenty-five of these 75 samples contained no bile. It is apparent, therefore, that regurgitation of duodenal juices without bile is actually more common than with bile. The *a priori* assumption that the presence of bile in a specimen from the stomach is an indication of duodenal regurgitation is thus invalidated.

The well known intolerance for food of postoperative patients is therefore associated with a total achlorhydria in most cases. Our experiences indicate a common lack of free gastric acidity, which might be an obvious explanation of the clinical phenomenon. Almost uniform presence of pepsin with little or no free acid in gastric contents vomited after operations indicates that reduction in acidity is due to neutralization by duodenal contents rather than by lack of active gastric secretion. It is important to recall that pancreatic juice contains large amounts of sodium carbonate which will be liberated on acidification. An obvious mechanism is suggested for the rapid formation of gas in the stomach. If ordinary gastric juice and pancreatic juice be mixed *in vitro* the amount of gas produced is very striking as they effervesce almost like a Seidlitz powder.

Boldyreff's theory of the acid control by alkaline reflux can thus probably be widely applied. Jones[2] showed that pancreatic juice had considerable more neutralizing power than bile and it is secreted in larger amounts. Under the conditions with which these data were collected the secretion of bile is at a minimum. Whipple[3] and many others have showed the delicate mechanism of bile excretion. Ether in particular has a very marked depressing effect. Following the operative establishment of a biliary fistula, the flow is very scant for the first day or two.

The obvious deduction to be drawn from these studies is that in the treatment of postoperative vomiting and nausea, measures are indicated which would increase the gastric acidity.

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[2] Jones, K. K., PROC. SOC. EXP. BIOL. AND MED., 1931, **28**, 567.

[3] Whipple, G. H., *Physiol. Rev.*, 1922, **2**, 440.