

112 (1290)

The determination and significance of intragastric conductance.By **OLAF BERGEIM.**

[From the Laboratory of Physiological Chemistry, Jefferson Medical College, Philadelphia, Pa.]

A retention stomach tube in the form of an electrolytic cell has been devised which makes possible the determination of intragastric conductances at any desired interval of time without disturbance or removal of gastric contents. The tip contains also a thermocouple which makes possible intragastric temperature determinations and corrections, and an aspiration tube by means of which samples of gastric contents may, if desired, be collected for analysis. By means of this apparatus intragastric conductance variations were studied in connection with determinations of total acidity, free hydrochloric acid, pepsin, and trypsin.

The conductance of gastric juice is mainly due to the free hydrochloric acid which it contains and the same is generally true of the gastric contents. After the introduction of water or solutions (as sugar solutions) of very low conductance, the curve for conductance very closely follows the curve for free and total acid. This indicates that the equalization of osmotic concentration is brought about primarily by secretion of normal gastric juice.

After the ingestion of food containing protein the conductance curve usually lies below that for free hydrochloric acid as determined by titration because the latter values are high due to gradual dissociation of the protein salt. In the presence of weak organic acid as after fruit ingestion or of phosphate, as where much saliva is swallowed, the conductance falls below titration values and is a better measure of free hydrochloric acid.

Aside from the swallowing of saliva, the conductance of which is low, intragastric conductance is, after the first hour or so of digestion, almost always considerably modified by the regurgitation of pancreatic juice or bile or both and possibly to a lesser extent by pyloric and duodenal secretions. The conductance of pancreatic juice and bile being usually very low as compared with that of the gastric contents at maximum acidity, regurgitation

tends to markedly lower intragastric conductance as well as acidity. Conductance, however, rises relative to free hydrochloric acid on account of the higher salt content of these regurgitated secretions. After the ingestion of mineral acid, neutralization is brought about in the same manner as during digestion.

In achylia where intragastric digestion was mainly pancreatic in character, the conductance was found to parallel the concentration of pancreatic juice as measured by the tryptic index.

113 (1291)

The calcium content of the blood serum in certain pathological conditions.

By **JOHN O. HALVERSON, HENRY K. MOHLER** and **OLAF BERGEIM.**

[Laboratory of Physiological Chemistry of Jefferson Medical College, Philadelphia.]

The calcium content of human blood serum was determined in several normal cases and in a number of pathological conditions. In the normal cases values lying between 9 and 11 mg. of calcium per 100 c.c. were obtained. In nearly all of the pathological conditions studied, including cases where the blood clotted with extreme slowness, a similar range was observed, indicating a great constancy of this element in the blood serum. Distinct decreases were noted in cases of hematogenous jaundice, eclampsia, pneumonia, and particularly uremia. In several cases of uremia increases in serum calcium were noted on improvement in the clinical condition and following administration of calcium lactate. The urinary calcium excretion in severe nephritis was found to be low and calcium lactate administration brought about but slight absolute increases. Where marked general edema occurred, with or without nephritis, the excretion of calcium was unaffected by increased ingestion. In a case of pernicious vomiting of pregnancy with severe acidosis, alkali administration decreased calcium excretion to eight per cent. of its original value.

It is pointed out that as the red corpuscles are nearly free from calcium, determinations of this element in whole blood are of