and frequent contractions of the ureter offer a greater resistance to the effects of the anesthetic. It sometimes happened that after the administration of an anesthetic the large contractions of the middle part of the ureter disappeared while the superimposed undulations persisted. The same sometimes occurred after prolonged experimentation. The small and frequent undulations are apparently more resistant to fatigue, also, than the larger contractions.

8 (151)

Gastric peristalsis under normal and certain experimental conditions.

By **JOHN AUER.**

[*From the Rockefeller Institute for Medical Research.*]

The published observations upon gastric peristalsis in rabbits all seem to show that this organ, under so-called normal conditions, is practically inert. By means of the method to be described, it will be shown that the organ mentioned, under more truly normal conditions, shows active movements. The fault lay with the method; the profound inhibitory effect which opening of the peritoneal cavity exercises upon some of the abdominal viscera was not considered.

But operation is by no means necessary in order to study gastric motility in the rabbit. If a well-fed rabbit is stretched out on its back and the hair of the epigastrium clipped, any observer may see active gastric peristalsis under a closer approximation to physiological conditions than the saline bath affords. Mere inspection of the abdomen now shows that the stomach is far from inert. A short time after preparing the animal, peristaltic waves are seen coursing over the stomach from left to right, increasing in strength as the pyloric third is approached. These waves are easily registered by placing a tambour over the stomach region to be studied and connecting it with a writing tambour or manometer. The writing tambour registers not only the change in volume of the stomach part it overlies, but also the respiration of the animal; in many cases, with delicate adjustment of the writing pen, the heart beats are also marked.

That gastric peristalsis may thus be observed under almost normal conditions is not known, so far as I am aware.

Some of the results obtained by this method are as follows:

1. As a rule the stomach shows no sign of motion for a little while after the animal is stretched out.

2. After a few minutes a shallow constriction appears near the fundus and travels to the right over the stomach, becoming deeper as it progresses in that direction. The wave causes marked bulging of the pyloric third after peristalsis is well established.

3. Ether given by inhalation through the nose causes usually an immediate stoppage of gastric motion for a varying length of time. After that, peristalsis is reëstablished and continues even though the ether be pushed so that the corneal reflex becomes sluggish. Ether given through the trachea by means of a cannula has no inhibitory effect upon gastric peristalsis.

4. Curare injected intravenously does not abolish gastric peristalsis so long as artificial respiration is maintained. Stoppage of respiration causes cessation of the stomach movements. After resuming ventilation of the lungs a number of minutes elapse before gastric peristalsis again appears.

5. Section of both vagi in the neck causes stoppage of gastric peristalsis at once; tracings taken after thirty minutes, or after two, four or twenty hours show no detectable movements of the stomach.

6. The stomach of a rabbit that has fasted for twenty-four hours shows as a rule a marked diminution of the waves in strength and frequency, or none at all. Feeding reëstablishes peristaltic movements.

7. Opening the abdominal cavity causes cessation of the stomach movements for an indefinite period.

8. A moderate dose of morphin injected subcutaneously abolishes gastric motility for many minutes.