

balanced and safe for distribution. Prepared as stated it retains its balance eight months and possibly much longer and its practically full immunizing value at least a year. What slight deterioration occurs takes place equally in the toxin and antitoxin and therefore there is no danger of the mixture becoming toxic.

Constitutional disturbances are frequent. They are usually observed in adults, especially in those who give a pseudo Schick reaction. These disturbances are mostly due to the bacillary substances which are present in the diphtheria toxin.

Methods for refining the mixture for the complete removal of the bacillary substances have not been found. Considerable of these reacting substances can be eliminated through the use of ammonium sulphate, sodium chloride and alcohol.

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#### **Further observations upon reflex gastric hypermotility.**

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Increase in the force or rate or change in the direction of gastric contractions have followed irritation of the gallbladder, duodenum, or appendix, experimentally, and these motor changes have been associated with pathological gallbladders, duodenums, and appendices, clinically.<sup>1</sup> It may be assumed, subject to further experimental proof, that these organs constitute three of the possible foci of reflex gastric stimulation. Were the nerve paths known along which these impulses travel, it might be possible to explain these motor responses and group other possible causes of gastric motor unrest.

Other observations of abnormal reflex gastric activity in which the pyloric and fundic parts functionate separately are the following:

1. Prostalsis of the pars pylorica, alone, occurring in the course of irritation of the above organs and after thoracic vagus section.
2. Anastalsis of the pars pylorica, alone, associated with traumatization of the gallbladder.

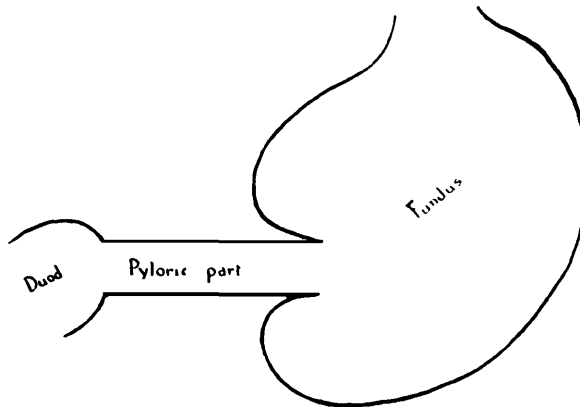
<sup>1</sup> PROCEEDINGS SOC. EXP. BIOL. AND MED., Vol. XVI., No. 7.

3. Pro- and anastalsis of the pars pylorica, alone, after extra-gastric traumata before the stomach appears to settle down to definite rhythmical contractions and is produced mechanically by dividing or blocking the stomach at the junction of the pyloric part and the fundus. It also follows thoracic division of the vagi.

4. Pylorospasm, diffuse, with fundic relaxation resembling a pylorofundic intussusception (see diagram).

This fourth type has been observed repeatedly under experimental traumatization of the gallbladder, duodenum, or appendix and once in the human with evidence of appendical and gallbladder disease. It can be produced by direct stimulation of the lesser curvature at the junction of the descending and horizontal arms. The subjective evidence, associated with this motor state, is anorexia, vomiting, and epigastric pain. The objective signs are mass and tenderness over the stomach, present at times and absent at other times. This form of motility, as appears to be the rule with the reflex types, disappears with parietal peritoneal irritation.

Experimental data, to date, indicate the total hypermotility to be of probable vagus and the pyloric hyperactivity, alone, to be of probable vago-sympathetic origin.



**SCHEMATIC REPRESENTATION OF DIFFUSE PYLORIC SPASM AND FUNDIC RELAXATION RESEMBLING A PYLORO-FUNDIC INTUSSUSCEPTION.**