

in the Care of the Insane" in some of our modern institutions. He says:

"Here, indeed, was a vast organization, but what of the unhappy beings for whom it existed? There were hundreds of them isolated from their friends and kindred, yet huddled together and treated as one—a being from whom all society shrank as from a pestilence. Their physical comfort was cared for to the last degree; no reasonable demand was denied. But nowhere was there the suggestion of treating the disease which brought them there. All other needs were supplied save that. It was a sight to make one's heart sink. One could not refrain from asking, 'What are you doing for the man's insanity?' He is not a prisoner; he is a patient. You amply clothe his body and suitably feed him and comfortably protect him. What have you done for the treatment of his diseased brain? To this the chief physician and his two assistants—a man and a woman—think of only those three for that army of brain-sick beings!—could not reply. So long as the lunatics were made comfortable and treated kindly, well fed and afforded religious consolation, and amused to their heart's content, little more remained to be done. Medicine could offer no further advice, and consequently the services of one physician of experience were deemed sufficient to overlook the general health of the community. This vast establishment instead of developing into a great hospital for the cure of the disease, instead of affording a laboratory where scientific investigations might be made, had done little more than maintain a high character as a model lodging house for the insane.

"In the meantime, from the operation of peculiar circumstances, the diseased conditions of the brain which threaten or constitute insanity have practically been left almost uninfluenced by the advance of medical science. Speaking generally, this advance has been the work of hospitals, and the insane have been denied participation in its benefits because they have been relegated to asylums, the primary object of which is to dispose of the insane in such a manner that they may injure neither themselves nor others. They are permitted to recover, if they can.

"The value of a hospital report scientifically is questionable, but the meagerness of this one is to be deplored. From a resident population of 500 persons nothing is denoted by this report except the almost idle classification of the maladies of the afflicted ones into a dozen or so groups. The significance of this leads one to consider whether an insane person is assisted to get well by its being written down that his case should be included under such and such a classification, founded upon the character of his delusion or the peculiarity of his conduct; while the real basis of his physical disease on which his condition depends is very liable to be buried under a nomenclature which is apt to degenerate into jargon." "We seek almost in vain in our asylums for evidences of systematic inquiry into the study of diseased states of the brain, or of their treatment by which mental equilibrium may be restored. It is most rare to find a special pavilion for the obser-

vation and treatment of recent and acute cases." "The heavy burden of expense in every state, the duty of men to their afflicted brother, demand it. The necessity for some preventive measures is becoming apparent to all. Such preventive measures must be directed to the care of incipient and acute cases. For this we need numerous, well-equipped, psychopathic hospitals and numerous well-equipped alienists among our general practitioners. What every case of insanity demands, as the primary condition for recovery, is separate and individual treatment and consideration."

"The patients should be attended by carefully trained nurses. They should be submitted to the same system of examination as the patients in general hospitals. Every scientific appliance for the diagnosis and treatment of the disease should be called into requisition, and every phenomenon should be carefully recorded. Each patient should be treated on the purest hospital principles for at least a year, unless recovery has been attained in a shorter period."

A CASE OF INFANTILE PYLORIC STENOSIS, WITH AUTOPSY SIX AND ONE-HALF MONTHS AFTER SUCCESSFUL GASTRO-ENTEROSTOMY.*

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PATHOLOGICAL REPORT.

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CHARLES D., born at full-term May 20, 1907, after a low forceps delivery, was the first child of healthy parents. He was normal at birth and weighed 6½ lb. The breast milk appeared early and was abundant. It was examined on two occasions and found normal. He gained steadily and was perfectly well until he was two weeks old, when he weighed 7½ lb. He then began to vomit and vomited continuously up to the time he was seen, July 6, 1907, when he was seven weeks old. At that time he was vomiting everything, sometimes immediately after nursing, at other times just before nursing. At other times he kept down several nursings and then vomited a very large amount at once. Giving the breast-milk in a bottle made no difference in the vomiting. Diluting it with lime water and water during the nursing had no effect. He never vomited bile. His bowels moved once or twice daily. The movements were small and consisted largely of mucus. They were not dark colored. He had lost weight steadily, then weighing only 6 lb. 10 oz.

Physical examination.—He was small and thin, but of fair color. The abdomen was sunken. He was fed and immediately vomited. The vomiting was not characteristically explosive. He was fed again and retained it. When the stomach was full there was marked visible peristalsis, the waves passing from left to right. The lower border of the stomach was about 1 cm. below the navel. In the right nipple line, just at the edge of the liver and deep down, a mass feel-

* Read before the New England Pediatric Society, Feb. 15, 1908

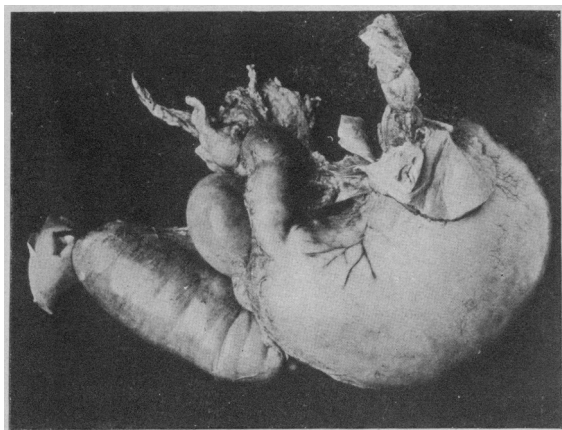


FIG. 1. Anterior surface of the stomach.

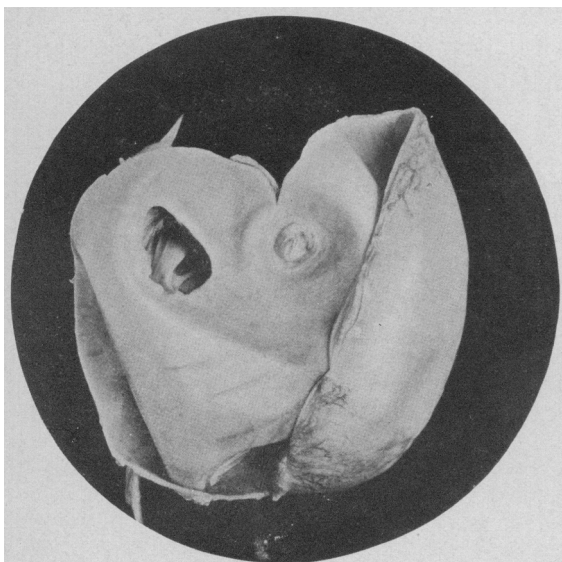


FIG. 2. Pylorus and gastro-enterostomy opening from the stomach side.

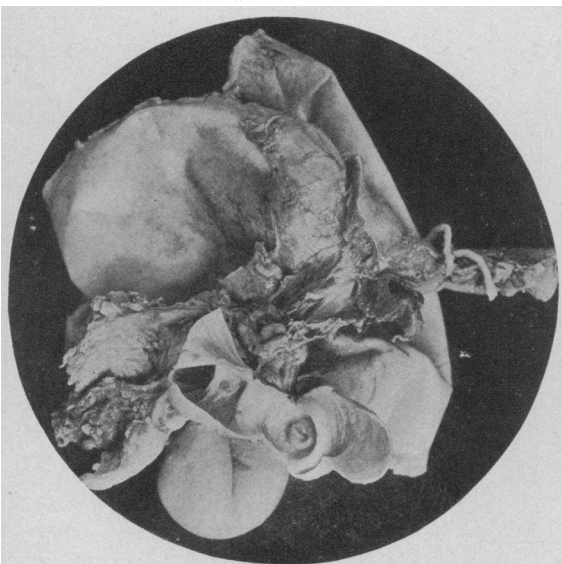


FIG. 3. Pylorus from the duodenum.

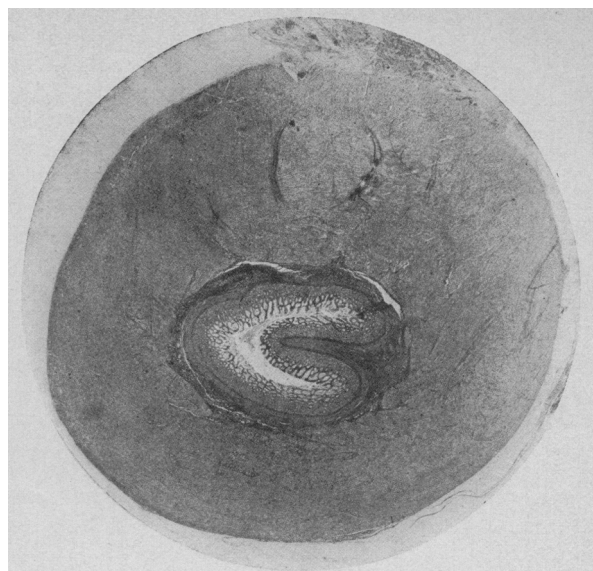


FIG. 4. Cross section of the pylorus through about the middle showing the folding of the mucosa and the great thickness of the muscularis.

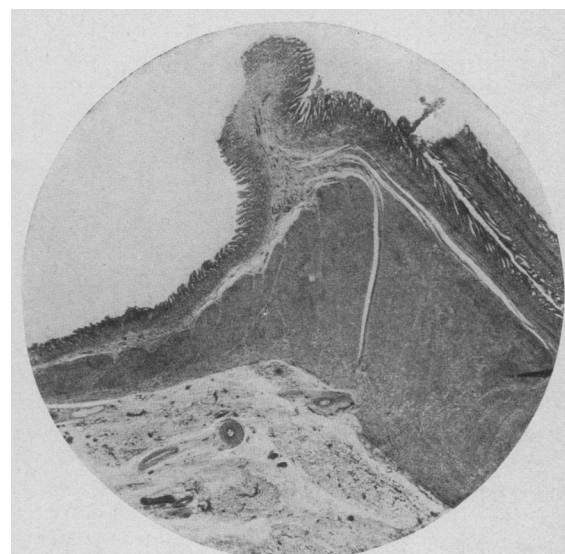


FIG. 5. Longitudinal section of the pylorus on stomach side, showing the relative thickness of the pylorus and the stomach wall.

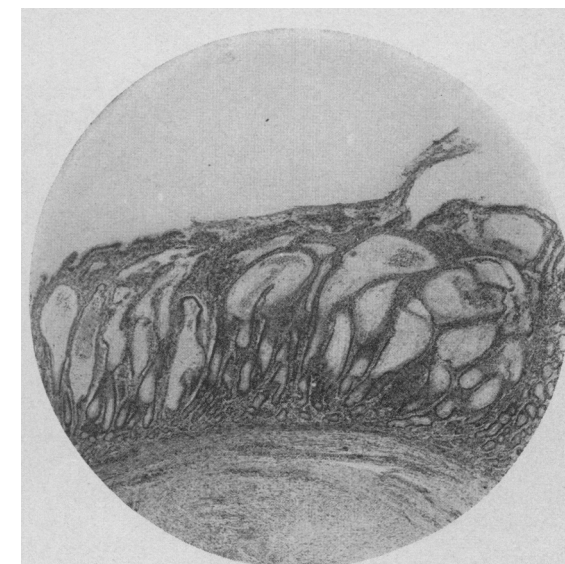


FIG. 6. Mucosa, showing the dilatation of the glands with mucus.

ing a good deal like 2 cm. of a lead pencil was indistinctly made out. The rest of the examination was entirely negative. Immediately after the examination he vomited a large amount explosively.

Operation by Dr. Murphy, July 8, at 10 A.M. He was given half an ounce of peptonized milk by enema every three hours during the previous night. His condition at the time of the operation was fair. The stomach was washed out and found empty. An incision was made, 2 in. long, just at the edge of the median line in the epigastrium. The stomach was found markedly dilated, the lower border extending below the umbilicus. The walls were thickened and edematous. The omentum contained no fat. At the pylorus was the typical tumor of congenital pyloric stenosis. This was about one inch long and as large round as the first finger of an adult. It was bluish in color, hard and elastic to the touch. There was a marked constriction ring on the gastric side. The small intestine was collapsed and abnormally small; the large intestine was not remarkable. A no-loop posterior gastro-enterostomy was done, clamps being used. Celloidin linen was used for all sutures. The jejunum was anastomosed to the stomach in the pyloric region running from right to left and downward to the greater curvature. The "in, out and over" stitch of Mayo's was used on the anterior suture. The jejunum was stitched to the stomach wall on either end beyond the line of suture. The stomach and intestine were kept warm with salt solution during the operation. The abdominal incision was closed with through-and-through sutures of silkworm gut with interrupted chromic gut sutures in the fascia. The condition at the end of the operation was good, as was the recovery from ether.

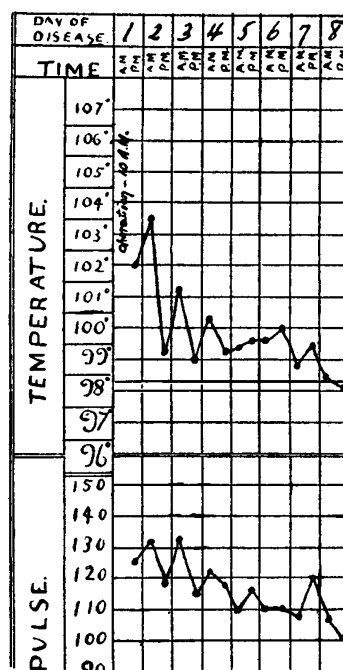
Convalescence. — The feeding in this case was of considerable interest. The operation was done at 10 A.M. Nothing was given until 6 P.M., when 2 drams of breast milk were begun and repeated every two hours. During the next twelve hours about a teaspoonful of brownish material was vomited after each feeding. Nutrient enemata, begun at the same time, were retained. The breast milk was then reduced to 1 teaspoonful every hour. This was vomited almost continuously, the vomitus being mixed with bile. Washing out the stomach brought away a good deal of bile and mucus. Enemata of 4 drams of peptonized milk every four hours were retained, as was salt solution in 4 oz. doses given subcutaneously. Vomiting due to peritonitis or mechanical obstruction was ruled out by the physical examination and general condition, and irritation of the stomach accepted as the explanation. The next day, that is, forty-eight hours after the operation, a mixture of breast milk $\frac{1}{4}$, lime water $\frac{1}{4}$ and water $\frac{1}{2}$ was given in $\frac{1}{2}$ dram doses, every hour. This was retained and quickly increased to a dram at a feeding. Both the strength of the mixture and the amount at a feeding were then rapidly increased, the changes being well borne. One-half ounce at a feeding was not reached, however, until the end of a week. He began to take the breast on the eleventh day. The enemata were kept up for four days and salt solution was given subcutaneously from time to time for eight days. Everybody concerned with the case felt that the salt solution subcutaneously, and to a less extent the rectal feedings, had a great deal to do with the successful result. This baby, at any rate, was unable to take even diluted breast milk in any considerable amounts in the beginning. The bowels began to move in thirty-six hours, the movements at first resembling meconium. They showed no traces of milk until the fifth day.

Further history. — The baby continued to do ab-

solutely well, weighing 19 lb. when seven and one-half months old. During this time it had had only breast milk, had not vomited, had had perfectly normal movements and had developed in every way like a normal baby. It was taken ill Jan. 16, 1908, when eight months old, and died Jan. 25, after a rather indefinite illness, which proved by autopsy to be idiopathic peritonitis.

Autopsy by Dr. Wolbach twenty hours after death.

The body was well developed and well nourished, 68 cm. long. The prepuce presented a clean, crusted line secured with catgut sutures, the result of a circumcision Jan. 16. Careful dissection, with special reference to an ascending infection, showed nothing abnormal. The thymus, pleural and pericardial cavities, heart, lungs, liver, spleen, pancreas, kidneys, adrenals and aorta showed nothing abnormal.



The omentum was adherent to the peritoneum at the site of the old operation wound over an area about 1 cm. in diameter. The peritoneal cavity contained a large quantity of rather thick, yellow, puriform material. The intestines were everywhere glued together by yellow fibrinous material. The surface of the liver, spleen and portions of the mesentery, which enclosed quantities of puriform liquid, were coated with a thick layer of elastic fibrinous material. The appendix was normal, 4 cm. in length, was directed upwards and backwards, had a mesentery and showed the fold of Treves. The peritoneal surfaces of the gastro-intestinal tract were pale, except those portions directly in contact with the exudate, which showed a moderate degree of injection. The lesser peritoneal cavity contained an exudate similar to that in the general cavity. The stomach and intestines were moderately distended with gas. The pylorus was tightly contracted and of a distinctly yellow color in contrast to the normal pinkish-gray of the stomach and duodenum. On palpation it presented as a firm resilient cylinder, 1.5 cm. long. There was a sharp line of junction between the slightly distended stomach and the contracted pylorus. The external diameter of the pylorus was 1.2 cm.; that of the duodenum, 2 cm. On the posterior wall of the stomach near the pyloric end was secured a loop of the jejunum. It was attached to the wall of the stomach in such a

manner that the proximal end ran parallel to the first portion of the duodenum. The proximal arm was about 10 cm. in length. Both proximal and distal loops were moderately distended with liquid contents and gas. The line of junction to the stomach was marked by a compact band of tough fibrous tissue. The mesenteric lymph nodes were large, soft and pale; on section they were uniformly pale yellowish white, moist and soft.

Gastro-intestinal Tract.—The esophagus, stomach and first portion of the small intestine were injected with a 10% solution of formalin and preserved *in toto*. The small intestine contained a small quantity of thin, yellowish plastic material, with an offensive odor. The large intestine contained a thin, liquid, yellowish material of slightly offensive odor. In the ascending colon the solitary follicles were slightly enlarged, a few of which showed minute depressions surrounded by narrow injected zones; otherwise the intestinal mucosa was normal.

The stomach was injected with a 10% solution of formalin, through the esophagus, which was cut about 9 cm. from the stomach. No pressure was used in filling the stomach, other than that exerted by the column of liquid. During the process none of the liquid passed through the pylorus, as was shown by the fact that when the gastro-enterostomy opening was kept closed it was impossible to inject the duodenum and loop of jejunum. On releasing the gastro-enterostomy opening, the duodenum filled via the proximal loop.

In the hardened stomach the gastro-enterostomy opening measured 3 x 1.5 cm.; the long axis was parallel with that part of the greater curvature of the stomach which was opposite the opening. The upper border of the opening, measured along the posterior wall of the stomach, was 2.5 cm. from the pylorus. The right border was parallel to and 2 cm. from the greater curvature. Stretched along the edge of the right side of the opening were three black-silk sutures. The communication between the stomach and the distal loop of the jejunum was a free one, measuring about 1.5 x 1 cm. It was situated at the lower end of the gastro-enterostomy opening, the upper portion of which was opposite the inter-adherent walls of the flexed intestine. The pylorus was tightly closed and both ends presented puckered folds of the mucous membrane, which projected slightly into the stomach and duodenum.

Anatomical diagnoses:

- Acute general fibrinous purulent peritonitis.
- Old gastro-enterostomy (functional).
- Circumcision (recent).
- Colitis (slight).

Microscopic description.—The heart, lung, liver, pancreas and aorta showed nothing abnormal.

Spleen.—There was a marked congestion and many small hemorrhages into the pulp. The splenic corpuscles were small, circular in outline and contained very few active cells. The pulp contained a slight excess of polymorphonuclear leucocytes and many mitotic lymphocytes. There were numerous clumps of large cocci; some were lanceolate diplococci; others were in chains, and occasionally a clear space surrounded a single pair of the organisms.

Kidney.—There was marked granular degeneration of many convoluted tubules and there were many imperfectly developed glomeruli. Otherwise the kidney was negative.

Adrenal.—The medulla contained many hemorrhages; otherwise it was negative.

Mesenteric lymph node.—There were large necrotic areas containing large colonies of micrococci in pairs

and chains. The follicles showed no evidence of activity. The sinuses were distended with cells, mostly large mononuclear cells with basophilic protoplasm. Many were undergoing mitosis. There were few polymorphonuclear leucocytes, but many of these contained numbers of cocci. Everywhere in the sinuses were enormous numbers of cocci.

A lymph node attached to the thoracic aorta contained cells and bacteria in the sinuses similar to those found in the mesenteric node.

Peritoneal exudate.—The exudate upon the surface of the spleen and intestine contained enormous numbers of large micrococci; a few occurred in pairs and were surrounded by clear spaces suggesting capsules; most, however, were in short chains. There were few cells and a small amount of fibrin. Most of the cells were degenerated large mononuclear cells, probably from the peritoneum, and polymorphonuclear leucocytes.

Pylorus.—A cross section taken through the middle of the pylorus showed a very thick wall of perfectly normal, smooth muscle. The increase in thickness was due chiefly to the increase in the inner layer of circular fibers. The submucosa was normal and was folded into the lumen. The glands of the mucosa were flattened and dilated with mucus, where the surfaces were in contact between the folds. The flattening and distortion of the glands was best seen in a longitudinal section made through the pylorus between the stomach and the space from where the circular piece was removed. This section showed the folded surfaces of the mucosa in contact. A similar section from the duodenal end showed normal smooth muscle in the thickened pyloric portion and normal submucosa. The mucosa showed very marked cystic dilatation of the glands, which were filled with granular coagulum. The duodenum was normal.

SUMMARY AND DISCUSSION OF AUTOPSY.

The cause of death was a general peritonitis without demonstrable anatomical cause. Special attention was given to the tissues about the gastro-enterostomy, both at the autopsy and afterwards in going over the hardened specimen. The condition of the gall bladder, appendix and gastro-intestinal tract rules out infection from these sources. The negative findings in the dissection of the spermatic cords and seminal vesicles make an infection from the penis very improbable. Normal pleural and pericardial cavities exclude these as sources of infection. Finally, the absence of any older localized process and the diffuse, even distribution of the exudate forces us to the conclusion that the infection took place through a vascular route.

The infecting organism, judging from the morphology in sections, may be either the pneumococcus or the streptococcus, probably the former, for growth in chains is not unusual in cultures and in exudates, while lanceolated, encapsulated forms are rare with organisms which can positively be identified as the streptococcus.

The microscopical findings in the pylorus are surprising, because of absence of degenerative changes in the smooth muscle, either in the form of atrophy or in connective tissue overgrowth. The closed state of the pylorus was proved by the mechanical tests applied and by the rigidity and thickness of the walls, which are in striking contrast to the usual post-mortem condition of the

pylorus in infants. The flattening of the mucosa can hardly be considered as an evidence of permanent closure. The cystic dilatations of the glands are probably mechanical in origin, though a few similar cysts have been seen in the mucosa of the normal pylorus of infants. In the case of an infant a few weeks old, operated upon for pyloric stenosis and which died a few days later, only slightly dilated pyloric glands were found. This fact supports the belief that in the case here reported, the long-continued closure of the pylorus was the cause of the glandular dilatation.

This is the first time, so far as we know, that any one has had the opportunity of studying the anatomical conditions in a case of infantile pyloric stenosis at so long a time as six and one-half months after a successful gastro-enterostomy. This case proves that in some instances, at least, the stenosis is not due to spasm, that medical treatment cannot be of any avail, and that the only hope for relief and life lies in surgical intervention. It also proves that an infant can live and thrive for many months, although all the food passes through the gastro-enterostomy opening and none through the pylorus. It suggests that the condition of organic infantile pyloric stenosis is a permanent one, that there is no tendency toward a restoration of normal conditions, and that there is little hope of the pylorus ever resuming its functions. It is not safe to draw conclusions from these suggestions, however, as it is possible that with the lapse of time and the growth of the parts, changes may occur which will result in the restoration of normal conditions and function. These points can only be decided by the actual observation of the anatomical conditions in cases dead at longer intervals after successful operations.

A CASE OF CONGENITAL STENOSIS OF THE PYLORUS.*

BY CHARLES W. TOWNSEND, M.D., BOSTON.

A MALE infant, sixteen days old, was admitted to the Boston Floating Hospital on Aug. 9, 1907, and was seen by me at the beginning of my service, four days later. The infant was born at full term on July 24, and had been breast fed until its admission to the hospital. Since then it had had its stomach washed, it had been fed on sugar water, whey and breast milk. Soon after birth regurgitation occurred, following each nursing. Later the vomiting became a marked symptom, generally after each feeding, and sometimes explosive or projectile in character. If the food were retained for one or two feedings, the total amount would afterwards be vomited. Almost continuous regurgitation of food was sometimes noticed, so that the napkin under the head was always wet.

The dejections were black and stringy, and their appearance, even on the twentieth day of the child's life, when I began my service, was that of meconium. Apparently no food found its way through the intestine, yet the infant appeared in fairly good condition, and showed but little loss of flesh or color.

The examination of the abdomen showed slightly greater prominence in the upper than in the lower

portion, and an increase in the area of stomachic resonance. At no time could any mass be felt at the pylorus, and no peristaltic movements could be seen.

The apparently good condition of the infant made it seem probable that some food was digested, and passed through the intestinal canal, but careful observation showed that as much was vomited as was received, and at no time was there any evidence of food material in the stools.

The case was referred to Dr. James S. Stone, but as the infant gained an ounce, and as the results of examination of the abdomen were so negative it seemed advisable to postpone the operation until the 24th day of the infant's life on Aug. 17.

OPERATION BY DR. J. S. STONE.

Ether anesthesia. Through a perpendicular incision through the outer border of the left rectus the stomach was exposed and was found to be much dilated. The pylorus was felt to be firm and enlarged. The whole large and small intestine was found to be collapsed. The lower anterior part of the greater curvature of the stomach was seized with clamps and a loop of small intestine immediately below the duodenum withdrawn and seized with clamps. An anastomosis was then made with a double row of silk sutures. During the operation the child stopped breathing and artificial respiration had to be continued for several minutes. Aside from this the greatest difficulty was in determining which loop of the collapsed small intestine led up to the duodenum. It seemed wiser in view of the condition of the child to do an anterior rather than a posterior gastro-enterostomy because the latter operation would have added a little to the difficulties. The child stood the operation, which was prolonged by the delay mentioned, fairly well and rallied well afterward. The abdominal wound was closed without drainage.

The operation was well borne by the infant. On the second day diluted mother's milk was given, and about half was retained. The movements for the first time in the infant's life showed traces of food. Vomiting continued, however, from time to time, the infant grew weaker and on the third day after operation, the twenty-seventh day of its life, it died.

The interesting points in the case are the facts that so little weight was lost, and that the color and general condition of the infant remained so good, notwithstanding the occlusion of the pylorus. The birth weight is not known. The weight on the 17th day was 7 lb. 5½ oz.; on the 19th day, 7 lb. ½ oz.; on the 21st day, 6 lb. 11½ oz.; on the 22d day, 6 lb. 12½ oz.; on the 24th day, 6 lb. 11 oz.

AUTOPSY BY DR. S. B. WOLBACH, on Aug. 20, 1907:

Body of a well-formed, fairly well-nourished, white male infant. . . . On the anterior surface of the stomach, close to the greater curvature, and about 6 cm. from the pylorus, there is sutured a loop of the small intestine. . . . The union between small intestine and stomach is firm and dry. There are no adhesions to other structures. The pylorus is felt as a very dense cylindrical mass about 1 cm. long and ¾ cm. in diameter. . . . Pylorus is tightly contracted; with slight pressure a tapering probe dilates the opening to 2 cm. in circumference. On section there is an enormous thickening of the muscle layer, forming a well-defined band en-

* Read before the Boston Society for Medical Improvement, Jan. 27, 1908.