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NEGATIVE DIAGNOSIS OF SURGICAL LESIONS OF THE STOMACH AND CAP

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The value of a positive diagnosis of cancer or ulcer of the stomach or cap is directly in proportion to the accuracy of the negative diagnosis. A diagnostic method which enables one to state with a reasonable degree of certainty that a patient has or has not a gastric cancer or ulcer, has or has not an ulcer of the cap, occupies a unique position. At the last annual meetings of both the Gastro-enterological Society and the Medical Section of the American Medical Association it was asserted repeatedly that the early diagnosis of gastric cancer is impossible. To this statement I take exception emphatically, referring you to numerous communications* which show the accuracy of the positive diagnosis of ulcer and cancer of the stomach and cap, and especially to a report on twenty-seven consecutive cases examined by serial Roentgenography and operated upon by Dr. Brewer.** Each of the twenty-seven cases presented sufficiently definite clinical symptoms of a lesion of the stomach or cap to justify surgical exploration. In eleven cases, or forty per cent of the number investigated, examination by serial Roentgenography resulted in a negative diagnosis of ulcer or cancer—or of any surgical lesion of the stomach or cap. Nor was a surgical lesion of the stomach or cap found at operation in any one of these cases. A negative diagnosis of gastric carcinoma and indurated ulcer of the stomach and cap has been made in five hundred and sixty-six cases out of the whole number of gastro-intestinal cases examined to date. Thirty-three of these cases presented sufficiently severe symptoms to justify surgical exploration; and it is upon the results in these thirty-three cases, operated upon by twenty-three different surgeons, that the present communication is based. The negative diagnosis of gastric cancer and ulcer of the stomach or cap was made in each case solely on the Roentgenographic findings, and in not a single instance was a lesion of the stomach or cap demonstrated by surgical exploration. In many cases a lesion at some other point in the gastro-intestinal tract was demonstrated Roentgenologically and proven by surgical procedure. As limited space prohibits a full consideration of each of the thirty-three cases, only eight characteristic cases will be described in detail and illustrated. Of the other twenty-five cases only the clinical diagnosis, Roentgenologic diagnosis and surgical findings will be given. In thirty-two out of the thirty-three cases the

*Arch. of the Roent. Ray, Dec., 1911, Apr., 1912, Oct., 1912. Journal of the Am. Med. Assn., Nov. 30, 1912. N. Y. Med. Jour., Feb. 14, 1914, Vol. xcic, No. 7, p. 305. Zeit. f. klin. Med., Berl., 79 . H. 5 u. 6, 1914. The Lancet, Lond., May 2, 1914, No. 4731, Vol. clxxxvi, p. 1230.

**Annals of Surgery (forthcoming issue).

surgical findings corresponded with the Roentgenographic findings in every essential detail, but in one case they differed to such an extent that it was impossible to explain the discrepancy. In most of the cases the incision was made directly over the pyloric end of the stomach, and in all cases the stomach and duodenum were examined through the laparotomy wound.

The technique by means of which our conclusions were reached has been fully described in previous communications.* An examination less complete than the one prescribed may suffice in a great majority of cases, but abbreviated methods lead to erroneous diagnoses in a sufficient number of cases to cast discredit on the Roentgen method and to rob it of the remarkable degree of accuracy which it can attain. Therefore I beg of you as Roentgenologists—do not apply the diagnostic principles described in this and previous communications to anything less than the complete serial examination.

Gastric cases may be divided into two classes with respect to a negative diagnosis of ulcer or carcinoma of the stomach or cap —(1) those which unquestionably present no unusual Roentgenographic findings, and (2) those presenting direct or indirect Roentgenographic evidence of a spasmodic lesion. The best illustrations of the first type of cases are found in symptomatically normal patients examined for experimental purposes. There is no difficulty in making a negative diagnosis of cancer or ulcer of the stomach or cap in cases of this kind, as the entire series of Roentgenograms shows the stomach and cap well distended and both surfaces of the pyloric sphincter clear-cut and well defined. Naturally such diagnoses are not proven by surgical procedure. Most cases however come under Class II. They have or have had more or less symptoms referable to the stomach and cap. Such symptoms, particularly "hunger-pain," are associated with spasmodic contractions of the stomach, pyloric sphincter or cap. These spasms present definite Roentgenographic findings, i. e., either direct evidence of the spasm itself or the results of continuous and repeated spasm, a condition already fully described in an article on the Relation of Lesions of the Small Intestine to Disorders of the Stomach and Cap.** They manifest an appearance simulating organic lesions from which they may and must be differentiated, lest the operative procedure indicated for a surgical lesion be performed at the site of a reflex spasm of unknown cause. The eight cases about to be described exemplify the marked discrepancies so often observed between the clinical and Roentgenographic findings.

*Amer. Jour. of the Med. Scien., July, 1914, Vol. cxlviii, No. 508, p. 92.

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Fig. 1—Case XXVII.

For eighteen months this patient had suffered with pressure from gas. In the last six months she had complained of acute epigastric pain, perpetual belching and some regurgitation of bile. Attacks were almost always accompanied by prolonged vomiting, at one time for seventy-two hours. There was an entire loss of appetite and constant diarrhoea. Roentgenologically no gastric or

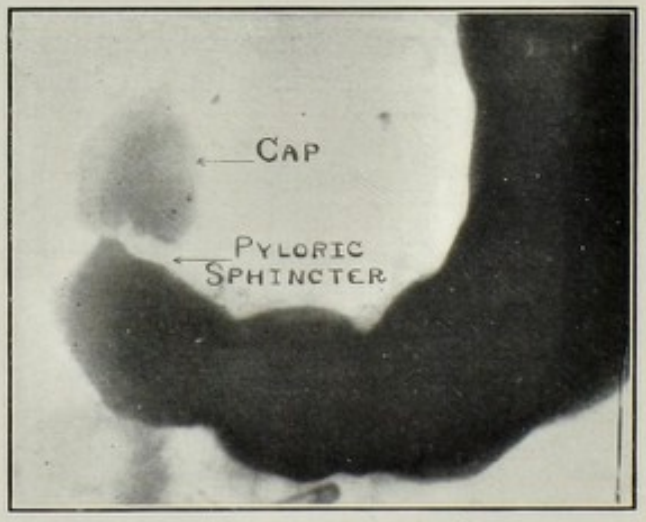

Fig. 1. Stomach Normal—Colonic Adhesions.

duodenal lesion was found. In the Roentgenograms of the colon a loop of sigmoid was observed to lie in close proximity to an extremely prolapsed caecum and ascending

colon in a manner suggestive of adhesions at this point. At operation no lesion of the stomach or cap was found. The entire caecum and ascending colon were removed and the ileum transplanted into the transverse colon.

FIG. 2—CASE XVI.

Fig. II illustrates one of the most extreme spasmodic conditions that we have observed. A negative diagnosis of new growth of the stomach was made. The report reads: "The irregularly shaped cap, the hazy edges of the sphincter, and the lack of

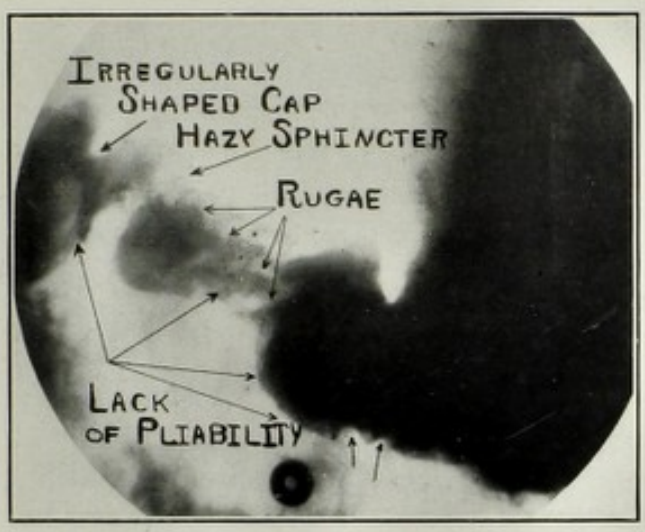

FIG. 2. Stomach Normal—Diseased Appendix.

normal expansion and contraction of the pars pylorica indicate that there is some lesion involving this portion of the stomach. The six hour stasis would indicate an organic obstruction at the pylorus, but I believe the stasis is due to some functional disturbance of the stomach and cap rather than to an organic obstruction." The following is an extract from a letter sent at the same time to the surgeon who referred the case: "This case is typical of a group of about twenty cases in which there has been evidence of a definite lesion involving the pars pylorica and cap. I have not felt that I could advocate surgical interference in any of these cases, although I am exceedingly anxious to know what pathological condition causes these Roentgenologic findings. Therefore if the clinical history is sufficiently severe to indicate surgery, I should like if possible to be present at the operation." The surgical diagnosis was "no cancer or ulcer of the stomach or duodenum and no adhesions." A chronically diseased appendix was removed through a second incision.

FIG. 3—CASE III.

A negative diagnosis of new growth, ulcer of the stomach or cap, and adhesions was made in this case. It was even stated that

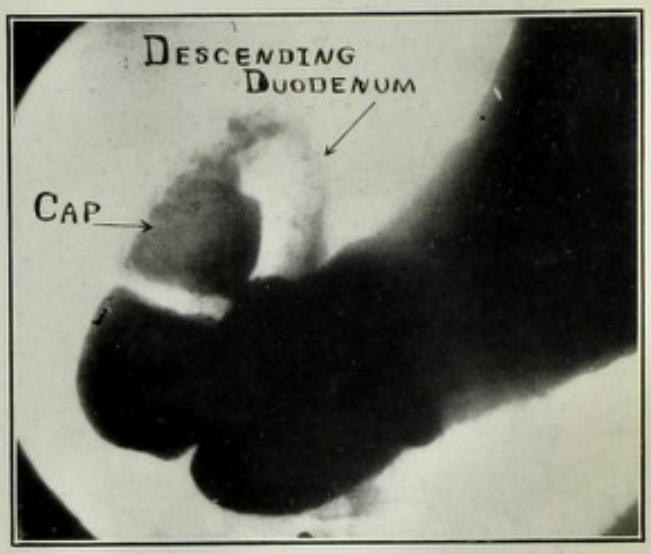

FIG. 3. Stomach and Colon Normal.

"one is justified in making a negative diagnosis of any organic lesion of the stomach or cap." The clinical history however was sufficiently characteristic of an organic lesion of the stomach and cap to justify surgical procedure. No organic lesion was found at operation, after which the surgeon pronounced the case one of "neurasthenia."

FIG. 4—CASE XIII.

The patient gave a history of several attacks of abdominal pain and fever, followed by soreness in the lower abdomen. One of these attacks had been diagnosticated as acute appendicitis by a competent physician. Subsequently the patient had suffered from digestive distress with more or

less epigastric pain, gas and sour eructations after meals. The Roentgenograms

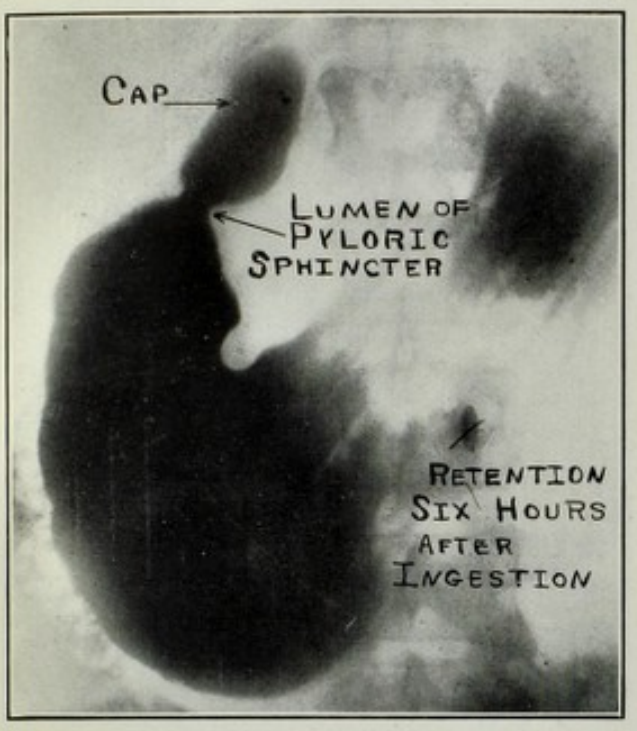

FIG. 4. Stomach Normal—Diseased Appendix.

FIG. 5—CASE XIV.

One of the cases which showed a glaring inconsistency between the clinical history and Roentgenographic findings was referred to me with a definite history of duodenal ulcer. The clinical history was so characteristic that there seemed to be no doubt of the diagnosis, and the patient was sent to me for the purpose of increasing my number of duodenal ulcers. This was a hospital case, and I economized on the plates, making only about one-half the usual number of exposures. The patient was to be operated on the next day for duodenal ulcer. My diagnosis was "spasm of the cap, negative diagnosis of new growth or indurated ulcer of the stomach or cap." This negative report delayed the operation temporarily. The following day the symptoms localized in the right iliac fossa and an emergency operation for an appendix was performed in the middle of the night.

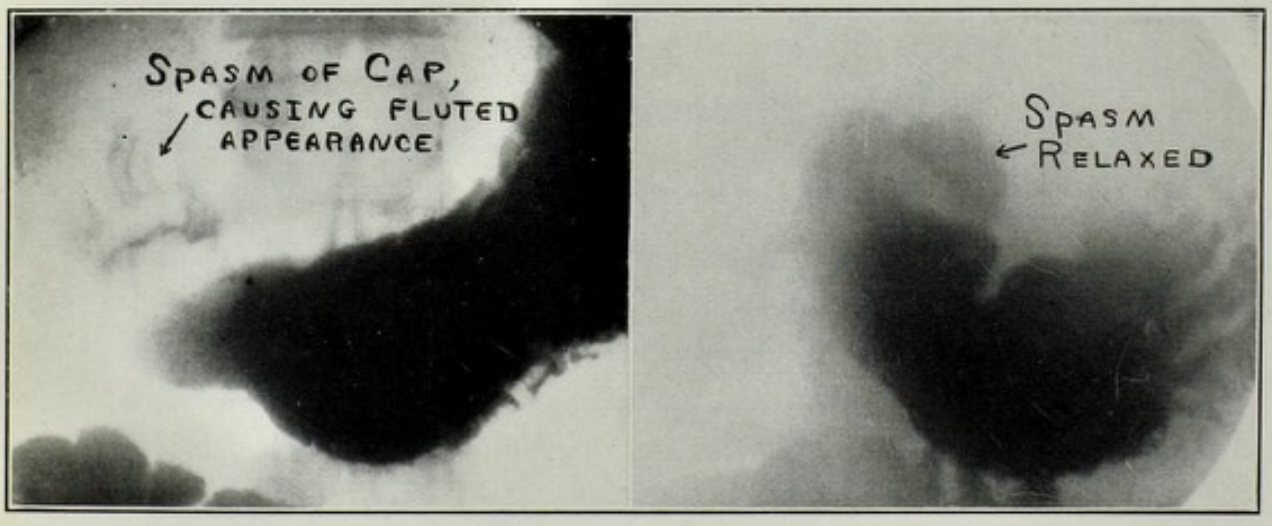

FIG. 5. Stomach Normal—Acute Appendicitis.

showed no evidence of new growth, ulcer or adhesions of the stomach or cap. The only unusual finding was a prolonged gastric retention. At operation the stomach, duodenum and gall-bladder were found to be normal. A chronically diseased appendix was removed. The gastric retention observed Roentgenographically was functional.

FIG. 6—CASE XV.

This patient had been under observation in the hospital for seven weeks with a typical history of gastric ulcer, inciuding even vomiting of blood, as we were informed later, although she appeared for Roentgenographic examination without giving a clinical his-

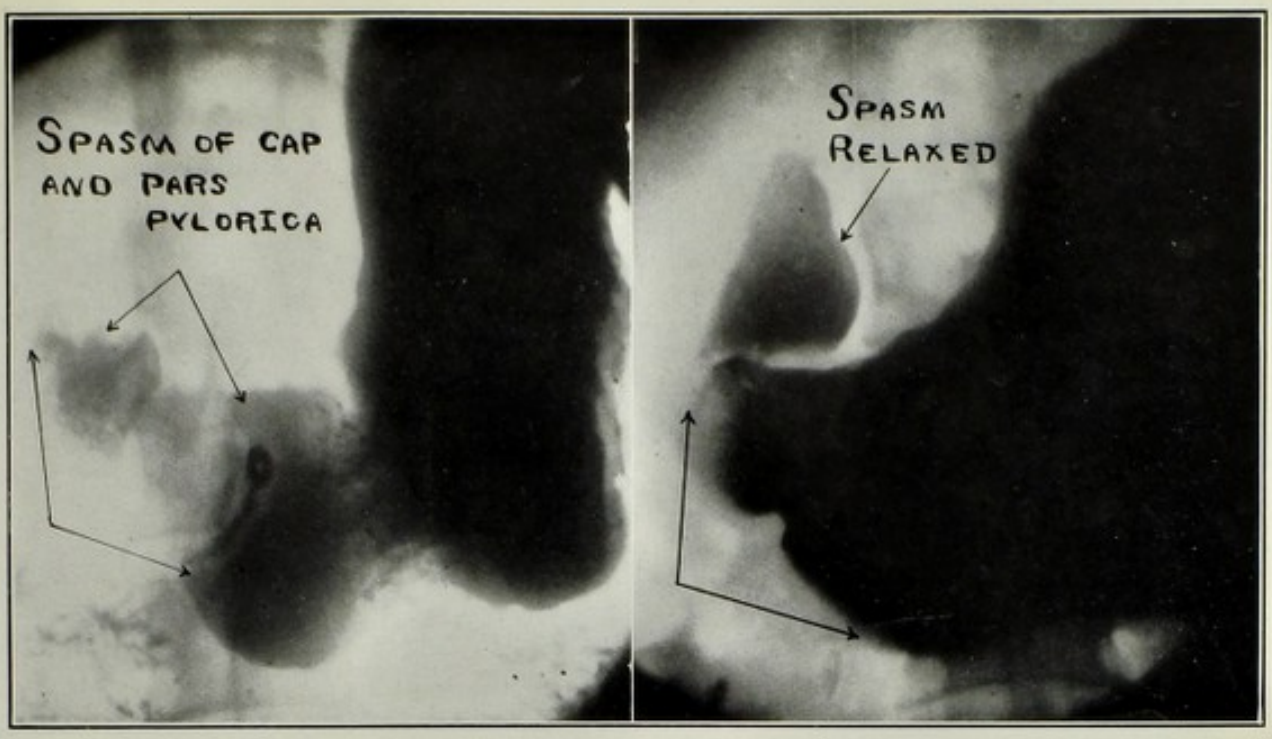

FIG. 6. Stomach Normal—Chronic Appendicitis.

tory. A Roentgenologic diagnosis of negative cancer or ulcer of the stomach or cap was made. An extreme functional derangement of the stomach was observed and the patient was advised to return for an examination of the colon and appendix. Subsequent examination showed a normal colon and bismuth retention in the appendix. We were then told that the clinical history was absolutely typical of gastric ulcer, and were offered an opportunity to hedge; but we "stood pat" on a negative diagnosis, and no surgical lesion of the stomach or cap could be demonstrated surgically. A thickened appendix filled with feces was removed.

FIG. 7—CASE XXVI.

The patient had been admitted to the hospital with a diagnosis of perforated gastric ulcer. His symptoms were acute epigastric pain and severe and protracted vomiting. The vomitus contained blood. Roentgenographically no evidence of new growth, indurated ulcer or adhesions of the stomach or duodenum was found. An acute angula-

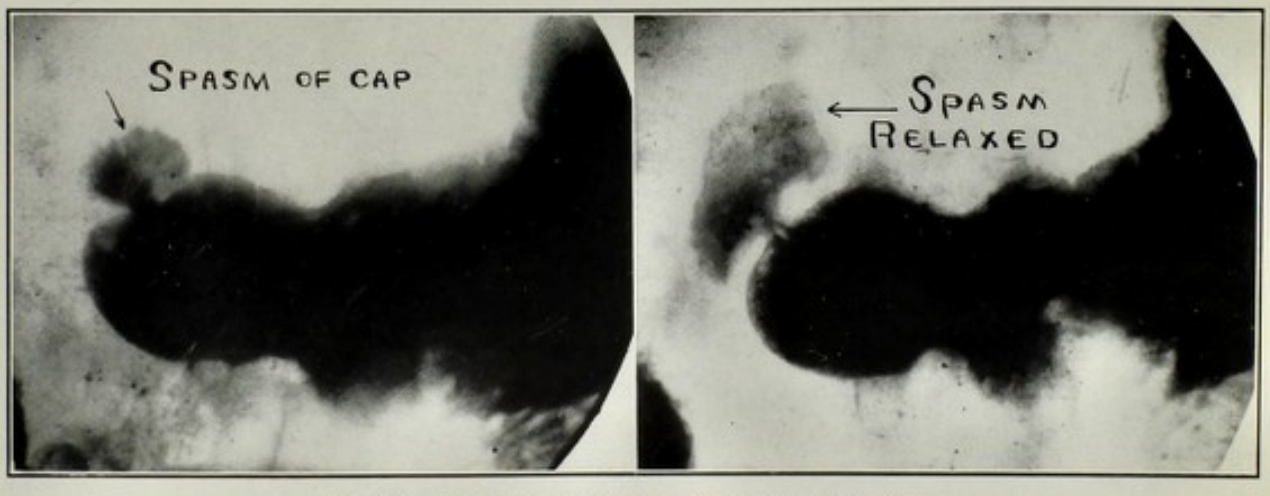

FIG. 7. Stomach Normal—Colonic Adhesions.

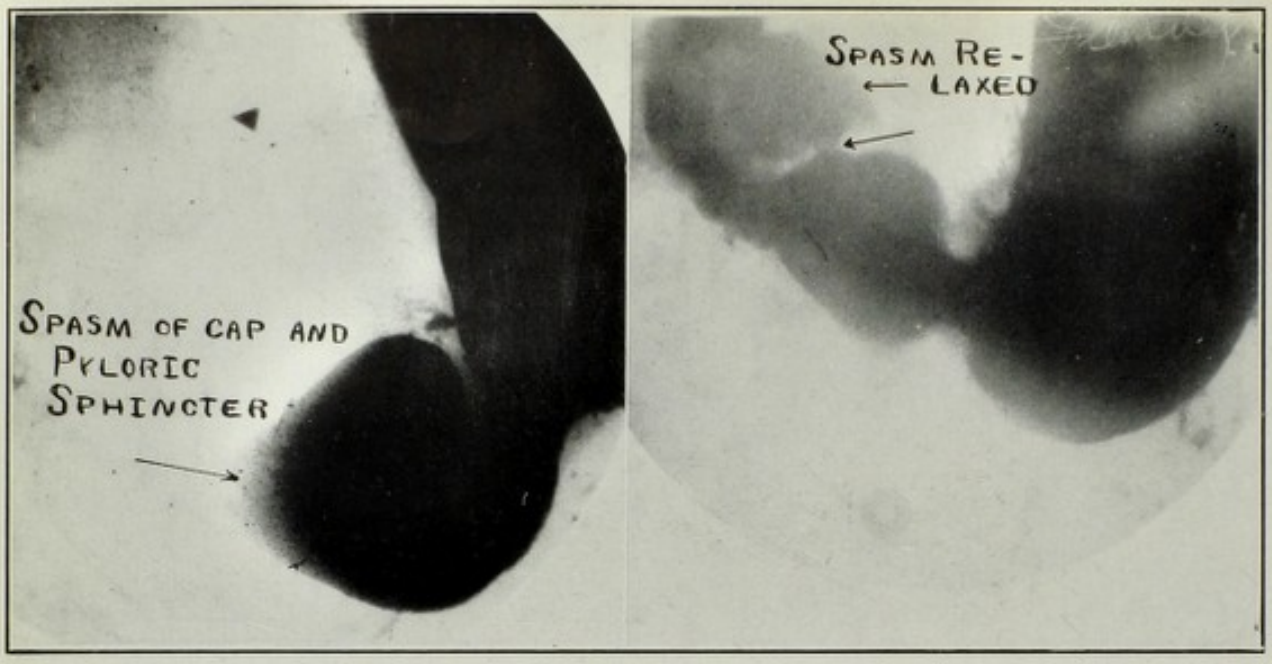

FIG. 8. Stomach Normal—Carcinoma of Colon.

tion in the first portion of the transverse colon was observed. Operation revealed a normal stomach, duodenum and gall-bladder. There was a band of adhesions on the ascending colon causing angulation.

FIG. 8—CASE XXVIII.

Eighteen months previous to the Roentgenographic examination the patient began to have dull pain after eating, sometimes in the epigastrium, at other times in the right or left iliac fossa, lasting from five to fifteen minutes with subsequent prolonged discomfort. There was a great deal of belching, soreness across the lower abdomen and through to the back, and a loss of twenty-five pounds in eighteen months. Roentgenologically the important finding was a marked pylorospasm which at certain stages of digestion completely occluded the pyloric opening. When the spasm relaxed it was evident that there was no organic lesion of the stomach or cap. As a carcinoma of the colon was found at operation, it was unfortunate that the colon was not examined Roentgenographically.

The remaining twenty-five out of our thirty-three cases will simply be enumerated and the diagnoses given in brief. Many of the patients presented such atypical symptoms that a definite clinical diagnosis had not been attempted. The following is a list of the whole series of thirty-three cases, the eight cases already considered in detail being marked with a star.

	Clinical Diagnosis	Roentgenologic Diagnosis	Surgical Findings
CASE I.	GASTRIC ULCER.	Stomach and Cap Normal.	Stomach and Cap Normal.
CASE II.	PERNICIOUS ANEMIA.	Stomach and Cap Normal.	(Post Mortem Findings.) Stomach and Cap Normal.
CASE III.*	GASTRIC ULCER OR CARCINOMA.	Stomach and Cap Normal.	Stomach and Cap Normal. Diagnosis, "Neurasthenia."

	Clinical Diagnosis	Roentgenologic Diagnosis	Surgical Findings
Case IV.	Gall-Bladder Infection.	Stomach and Cap Normal. Negative Diagnosis of Gall-bladder Infection.	Stomach, Cap and Gall-bladder Normal.
Case V.	Pyloric Obstruction.	No Organic Lesion of Stomach or Cap. Prolapse and Slight Dilatation of Stomach.	Stomach and Cap Normal. Slight Dilatation of Stomach.
Case VI.	Gastric Ulcer.	No Organic Lesion of Stomach or Cap. Hypertrophy Gastric Muscularis.	No Organic Lesion of Stomach or Cap. Hypertrophy Gastric Muscularis.
Case VII.	Tumor of Spleen.	Stomach and Spleen Normal. Kidney not Examined.	Stomach and Spleen Normal. Hypernephroma of Kidney.
Case VIII.	Duodenal Ulcer.	Stomach and Cap Normal. Gall-stones. Colon not Examined.	Stomach and Cap Normal. Gall-stones. Colon not Examined.
Case IX.	Gastric Ulcer.	Stomach and Cap Normal. Gall-stones.	Stomach and Cap Normal. Gall-stones.
Case X.*	Gastric Ulcer.	Stomach and Cap Normal.	Stomach and Cap Normal. Cholecystitis.
Case XI.	Duodenal Ulcer.	Stomach and Cap Normal. Adherent Appendix.	Stomach and Cap Normal. Adherent Appendix.
Case XII.	Duodenal Ulcer.	No Organic Lesion of Stomach or Cap. Spasm of Cap and Pyloric Sphincter. Colon not Examined.	Stomach and Cap Normal. Diseased Appendix.
Case XIII.*	Chronic Appendicitis, or Duodenal Ulcer.	Stomach and Cap Normal. Prolonged Gastric Retention.	Stomach and Cap Normal. Chronic Appendix.
Case XIV.*	Duodenal Ulcer.	No Organic Lesion of Stomach or Cap. Spasm of Cap.	Stomach and Cap Normal. Acute Appendicitis.
Case XV.*	Gastric Ulcer.	No Organic Lesion of Stomach, Cap or Colon. Spasm of Cap and Pars Pylorica. Retention in Appendix.	Stomach, Cap and Colon Normal. Diseased Appendix.

	Clinical Diagnosis	Roentgenologic Diagnosis	Surgical Findings
Case XVI.*	Duodenal Ulcer.	No Organic Lesion of Stomach or Cap. Spasmodic Lesion of Pars Pylorica and Cap.	No Lesion of Stomach, Cap or Gall-bladder. Diseased Appendix.
Case XVII.	Prolapsed Kidney. Reflex Gastric Symptoms.	No Organic Lesion of Stomach or Cap. Spasm of Cap and Pars Pylorica. Gastroptosis.	Stomach and Cap Normal. Adherent Appendix. Prolapsed Kidney.
Case XVIII.	Duodenal Ulcer.	No Organic Lesion of Stomach or Cap. Pylorospasm. Adhesions Involving Caecum and Ascending Colon. Insufficiency of Ileocaecal Valve.	Stomach and Cap Normal. Adherent Appendix.
Case XIX.	Duodenal Ulcer.	Stomach and Cap Normal. Colonic Adhesions.	Stomach and Cap Normal. Appendicular Adhesions.
Case XX.	Gastric or Duodenal Ulcer.	Stomach and Cap Normal. Colon not Examined.	Stomach and Cap Normal. Chronic Appendix.
Case XXI.	Unknown.	Stomach and Cap Normal. Adhesions at Hepatic Flexure. Retention in Appendix.	Stomach and Cap Normal. Adherent Appendix.
Case XXII.	Duodenal Ulcer or Gall-Bladder Infection.	Stomach and Cap Normal. Retention in Appendix.	Stomach and Cap Normal. Diseased Appendix.
Case XXIII.	Cholecystitis.	Lesion of Cap and Pyloric Sphincter. Cause not Determined. Examination Incomplete.	Stomach and Cap Normal. Chronic Appendix.
Case XXIV.	Unknown.	Stomach and Cap Normal. Gastroptosis.	Stomach and Cap Normal. Numerous Adhesions and Kinks of Colon. Atrophic Appendix.
Case XXV.	Duodenal Ulcer.	Stomach and Cap Normal. Adhesions of Caecum and Ascending Colon.	Stomach and Cap Normal. Jackson's Membrane, Involving Colon, Appendix and Duodenum.

	Clinical Diagnosis	Roentgenologic Diagnosis	Surgical Findings
Case XXVI.*	Perforated Gastric Ulcer.	No Organic Lesion of Stomach or Cap. Spasm of Cap. Adhesions Involving Ascending and Transverse Colon.	Stomach and Cap Normal. Band of Adhesions on Ascending Colon.
Case XXVII.*	Gastric or Duodenal Ulcer.	Stomach and Cap Normal. Sigmoid Adherent to Caecum and Ascending Colon.	Stomach and Cap Normal. Adhesions of Caecum and Ascending Colon.
Case XXVIII.*	Gastric Carcinoma.	No Organic Lesion of Stomach or Cap. Spasm of Pyloric Sphincter. Colon not Examined.	Stomach and Cap Normal. Carcinoma of Colon.
Case XXIX.	Colonic Stasis.	Stomach and Cap Normal. Constricted Caecum. Insufficiency Ileo-caecal Valve.	Stomach and Cap Normal. Ulceration Large Bowel. Insufficiency Ileo-caecal Valve.
Case XXX.	Colonic Stasis.	Stomach, Cap and Colon Normal. Colonic Stasis.	Stomach and Cap Normal. Entire Colon Removed.
Case XXXI.	Colonic Stasis.	Stomach and Cap Normal. Colonic Stasis.	No Lesion of Stomach or Cap. Typical Case of Colonic Stasis.
Case XXXII.		Stomach and Cap Normal. Pressure on Stomach from Without. Colon not Examined.	Stomach and Cap Normal. Extensive Adhesions Small and Large Intestines.
Case XXXIII.	Gastric Ulcer.	Stomach and Cap Normal. Chronic Obstruction Duodeno-jejunal Junction.	Stomach and Cap Normal. Obstruction Duodeno-jejunal Junction by Enlarged Retroperitoneal Glands.

In the early days of Roentgenology I well remember the efforts of some men to prove by sawing bones in a zig-zag direction that the negative diagnosis of a fracture of a long bone was of little or no value. Later there was a considerable stir when it was stated that one is justified in making a negative diagnosis of renal calculus. Renal colic and renal calculus were considered synonymous until case after case of renal

colic had been operated upon in spite of the negative Roentgenographic findings, and no calculus found. In both these groups of cases there are and always will be occasional errors, usually due to incomplete examination or careless interpretation of the Roentgenograms. But the remarkable accuracy with which these conditions can be recognized when present has justified one in stating with a reasonable degree of certainty that if they are not shown Roentgenographically, they are not present. Our thirty-three consecutive cases, which have been operated upon for lesions of the stomach or cap in spite of a negative Roentgenologic diagnosis, form a basis for concluding that the high degree of accuracy attained by the Roentgenologic diagnosis of fractures and renal calculi may also be claimed for the negative and positive diagnosis of surgical lesions of the stomach and cap.