the custom of having discharged patients return to the hospital. They usually include the wards in their visit, greet the friends they left behind, encourage these by demonstration of their own recovery and well-being, and in not a few cases assist others in arrangements for discharge and employment, etc.

Former patients often continue outside the friendship formed at the hospital, and thus little social centres of mutual helpfulness are created. A men's club composed of recovered patients who need help in their fight against the drink habit meets regularly at the Psychopathic Hospital and has proved valuable to many members, and it is a frequent and pleasing occurrence in all the hospitals that former patients attend the dances and other social gatherings.

The technique of the home visitor cannot well be described in detail, being so diversified to fit the wide range of conditions encountered. It is sufficiently indicated in what I have already said about the adjustment of the environment, instruction in bodily and mental hygiene and securing of material aid to the extent possible.

The annual discharges from the public hospitals for the insane in this state are, in round figures, 2,000. A very large proportion of these patients are supervised for a period of six months, and many for longer periods, in the ways described,—not successfully in all cases by any means, but assuredly with a benefit to individuals and to the community, not to be measured by the cost of the service or by any statistics that might be compiled to show it.

(Series to be continued.)

THE ROENTGENOSCOPIC EXAMINATION OF THE STOMACH AND DUODENUM. A REPORT BASED ON THE FINDINGS IN 730 CASES, EXAMINED DURING THE YEAR 1914.*

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THE value of the roentgen ray as an aid to diagnosis in disease of the gastro-intestinal tract has been fairly well established, and many valuable contributions to the literature on the subject have appeared during the past five years.

The objection to its general use, especially in hospital clinics, has been largely one of expense.

The method described in this report has been employed at the Massachusetts General Hospital for the past two years. Results obtained by it, we believe, are at least as good as those obtained by more expensive methods, and it has made possible the use of this valuable aid to diagnosis in all classes of patients.

During the year 1914, 730 roentgen examinations of the gastro-intestinal tract were made.

* From the Roentgen Department of the Massachusetts General Hospital.

Of these, 209 show evidence of organic disease of the stomach or duodenum; 144 were operated upon and the findings proven or corrected. The following is an analysis of the findings in the proven cases.

ANALYSIS OF THE ROENTGEN FINDINGS.

A diagnosis of *duodenal ulcer* or a question of duodenal ulcer was made sixty-five times. Of these, 34 were operated upon and an ulcer found. Seven were operated upon and no ulcer found. The remainder either refused operation, or were treated medically.

Of the cases with negative ulcer findings, three were adhesions, two were chronic appendix, and two negative. In only one of these cases was the duodenum opened. There were four cases in which an ulcer was found which was not located by the roentgen examination. Of these, one was thought to be a gastric ulcer, one was adhesions, probably from a healed ulcer, in one the examination was not complete, and one was a small bleeding ulcer which was not found until the duodenum was opened.

Gastric ulcer was suspected or diagnosed 47 times during the year. Of these, 18 were operated on and found to be ulcer. Three were operated on and no ulcer found in the stomach, but the stomach was not opened. The remaining 26 were not proven. In no case was an ulcer found where a lesion had not been demonstrated.

In the three cases in which an ulcer of the stomach was not found at operation, in one the deformity was due to adhesions, and one showed no pathology. The error was probably due to the presence of spasm, or there may have been a small ulcer present, as the stomach was not opened. In one case, an ulcer on the lesser curvature, involving the pylorus, with much dilatation of the stomach, was thought to be a duodenal ulcer.

The roentgen findings suggested *malignant disease* of the stomach in 97 cases examined. Of these, 28 were operated upon and found to be malignant. Five were operated upon and no evidence of malignant disease of the stomach found. Of the five negative cases the findings at operation were malignant disease of the gall-bladder in one, one was adhesions, and in three the findings were negative. One case of malignant disease was found where no lesion was demonstrated, although the fluoroscopic findings were suggestive in this case.

In 18 cases of *adhesions*, abnormal peristalsis was present nine times, filling defects seven times, and 6-hour residue seven times. The conclusions were correct or partly so in all but one case, which was diagnosed malignant.

Seventeen cases of *gall bladder disease* (stones or inflammation of the gall-bladder) show positive findings in two, very suggestive findings in eight, one was diagnosed as duodenal ulcer, one as malignant disease, and in five the findings were negative. Abnormal per-

istalsis was present in 10 cases, filling defects in four, and a six-hour residue in seven. In about half of the cases the stomach was displaced to the right. Only two showed positive evidence of gall-stones. We have not been able to show the presence of stones in the large percentage of cases reported by other writers. This may be due in part to the type of patient studied.

Chronic Appendix. Of the 16 cases in which the stomach was examined, seven showed abnormal peristalsis, five filling defects probably due to spasm, and three six-hour residue. The conclusions were positive in four, suggestive in five, and wrong or negative in seven.

The roentgen findings in 12 negative cases were, abnormal peristalsis nine, residue two, filling defects four. The conclusions were correct in seven and incorrect in five. Of the five cases of error, cancer was suspected three times, gastric ulcer once, and duodenal ulcer once. In one case only was the stomach opened. This series of twelve cases is of interest, as it offers a chance to compare the value of the roentgen findings with those obtained by other methods. It may be assumed that the clinical findings were positive in seven cases where the roentgen findings were negative, and which showed no lesion at operation. Also for the purpose of comparison, we will assume that the clinical findings were negative in the five cases in which the roentgen findings were positive. The results are seven to five in favor of the latter.

Another interesting conclusion may be drawn from this group, namely, the negative roentgen findings are usually correct, but positive findings should be corroborated by clinical evidence.

ANALYSIS OF THE ROENTGEN FINDINGS.

Tabulation of cases operated upon from February, 1914-1915.

		Abnormal Peris- talsis.	Residue.	Filling Defect.
Duodenal ulcer.....	34	31	23	32
Cancer	29	23	22	28
Gastric ulcer.....	18	13	17	18
Gall bladder.....	17	10	7	4
Chronic appendix...	16	7	3	5
Adhesions	18	9	7	7
Negative cases.....	12	9	2	2

Tabulation of cases continued.

	Roentgen Findings Correct in	
34 duodenal ulcer.....	29	87.8%
29 malignant	28	97.6
18 gastric ulcer	18	100
17 gall bladder.....	10	58.8
16 chronic appendix.....	9	56.2
18 adhesions	10	94
12 negative	9	64
144	113	82

DUODENAL ULCER.

While irregularity in the filling of the duodenal cap is probably the most constant finding

in duodenal ulcer, occurring in 31 of the 34 cases in which an ulcer was found at operation, increase in the depth and vigor of the peristaltic wave is also quite constant, it being present in 27 cases. This finding may also occur in other conditions causing gastric irritation, such as adhesions, gall-stones and chronic appendix, but is less typical in form, the wave seldom showing much depth. The percentage in this series in which it occurred was 87 in duodenal ulcer to 58 in adhesions, gall-stones and chronic appendix, the conditions which most often cause deformity of the cap. Its absence in the presence of an atypical deformed cap is, therefore, of great help in forming correct conclusions. In other words, an abnormal cap with normal peristalsis is probably not ulcer.

Six-hour gastric stasis was present in 23 of the 34 cases, a fairly large percentage (73%); while in the other conditions causing deformity of the cap, residue was present in 58%. This finding is of further value, when the size of the residue is also considered, a large or medium residue being present in 50% of the duodenal cases and in only 17% of other conditions referred to.

GASTRIC ULCER.

Of the 18 cases operated on and proven to be gastric ulcer, in 10 the findings were sufficiently definite to make a positive diagnosis of ulcer. In eight the lesion was said to be probable ulcer, but malignant disease was not ruled out. All showed some irregularity in filling.

Seventeen showed six-hour stasis, nine showed lack of tone, and nine showed increased peristalsis. The nine cases where there was marked obstruction with dilatation and atony show sluggish or absent peristalsis.

The differential diagnosis between ulcer and cancer is often impossible, but the lesion in ulcer is usually less extensive and seldom annular; when located at the pylorus, stasis with dilatation is present early, peristalsis may be marked, which is rare in cancer.

MALIGNANT DISEASE.

In malignant disease, plates are of considerable additional value as they may bring out the mottled or finger-print appearance, described by Cole, and others. The cardiac end of the stomach may contain considerable growth and yet show no evidence of its presence upon a series of plates. In other words, the most positive finding,—irregularity of outline—is absent, and it is in these cases that errors are made on the negative side. But with careful fluoroscopic observations, particularly at the time the opaque meal is entering the stomach, such indirect findings, as delay at the cardia and irregular filling of the fundus, may be obtained and the diagnosis corrected. In the one case missed in this series, sufficient weight was not placed upon these findings, which were present. Fortunately in

this class of case, the tube findings were often quite definite.

It is fair to assume that of the 67 cases showing evidence of malignancy and which were not operated upon, some were not malignant, and that the diagnosis was corrected by the clinical finding. Therefore the greatest number of errors in this series has been on the positive side, which is the safe side. When there has been any great amount of doubt as to the findings, we have suggested malignant disease in these cases, feeling that it was the safe thing for the patient, and knowing that no radical treatment would be undertaken without corroborative clinical findings.

Can the roentgen examination replace the exploratory operation in malignant disease? We believe that in a certain number of advanced cases it can. Sixty-seven of the cases in this series were not operated upon. Some of these must be placed in this group. If there is no stasis and the roentgen findings are typical of an extensive lesion, we believe the clinician is justified in advising against operation.

The question also arises, "Do we miss the early case?" There is no evidence to prove that we do, yet we have very few cases in which a positive diagnosis was made where the growth was not too far advanced to be cured by operation. My belief is that these cases do not have sufficient symptoms to make them seek help until the lesions have become inoperable. This is especially true of hospital patients.

TECHNIC USED.

For the past year we have used the single opaque meal. The patient is allowed a glass of milk or a cup of coffee with a piece of toast at 7 a.m. He reports for examination at 10 a.m., at which time the stomach should be empty. A brief history is taken. This history is not taken with the object of combining it with the roentgen finding to make a diagnosis, but to give the examiner a chance to meet the patient and to conduct the examination in such a way that the greatest attention will be directed to those symptoms of which the patient complains. The opaque meal consists of 75 gm. of barium sulphate in 8 oz. of potato starch gruel. The stomach shadows will change in size with the amount of the opaque meal. The character of the peristalsis will also change somewhat with a different kind of meal. Therefore it is of importance that it be of standard size and composition. The patient takes the meal through a drinking tube while standing behind the fluoroscopic screen, and its passage through the esophagus and entrance into the stomach is noted.

The first swallow is taken with the patient in the oblique position, after which the antero-posterior position is assumed and the examination continued. In this way, the entire course of the esophagus is observed, the position of the stomach, and at times irregularity on the greater

or lesser curvature. As the stomach fills, the shape and position of the barium column give us an indication of the muscular tone, and by palpation we may locate tender points or fixed areas.

Pressure on the normal stomach will often force the barium through the pylorus and show an outline of the sphincter and cap. In many cases the examination may be concluded at this time, but should any of the findings vary from the normal, or if there is difficulty in obtaining a good cap and sphincter, the examination is continued with the patient in the prone position. The stomach is observed at every possible angle and in all phases of peristalsis; changes with respiration and position are considered, and the examination continued until a normal outline of the stomach and duodenum is seen, or the impossibility of obtaining it proven. We have found that by placing the patient face downward or a little upon the right side, upon the table (tube under, small screen over back), it is possible to demonstrate the duodenum and pyloric sphincter in the great majority of cases. Any defect in outline which can be reproduced upon a radiographic plate can be seen upon the screen in some of the various positions and phases. Should a lesion be found, a plate is taken with the patient in the position which best demonstrates it. Also in certain cases, showing an atypical deformity, a series of plates is taken for more careful study of variation in density seen in the barium shadows.

The patient is next given a small carbohydrate meal and told to abstain from all food and drink for six hours, at which time he is to report for the second observation. This is essentially a test meal, therefore it should be constant in size and character. Abstinence from food during the six-hour period should also be maintained. Failure to observe this point has in some clinics discredited the value of the six-hour residue. The absence or presence of barium in the stomach is noted, also the position of the head of the barium column. The ileum, cecum, and that part of the colon which is filled, are observed and palpated for fixed or tender points.

A third observation is made at 10 a.m. the following day, at which time the position, outline and contents of the remainder of the colon are studied. At this time, it is often possible to see and study the appendix.

The examination is now finished, and definite conclusions can be made in the majority of cases. It may, however, be necessary to continue the observations for one or more days until the colon is empty, or to repeat the examination after giving atropine and bromide, as described by Carman. Also when the trouble seems to be in the lower gut, to administer an opaque enema under screen observations.

Atropine tends to relax spasm. A very difficult class of case is that showing atypical deformities of outline. In the majority the deformity is due to spasm or adhesions, or both.

It is in these cases that atropine is of value. The deformity may disappear or the amount of the six-hour residue may be affected.

We have not found it necessary to give a cathartic either before or after the examination except in patients who are habitually constipated, nor has there been a single case of injury to the patient either by exposure to the ray or from barium. The digestive tract, however, should be free of barium at the time of operation.

It is only fair to state that the cases tabulated in this series represent work done at a time when the technic was being built up, and that they contain errors which would now be avoided.

In conclusion, we wish to state our belief that the technic which has been used by us, and which, with slight modifications, is that used by Barclay and Carman, offers the best chance of obtaining correct roentgen findings with the least possible cost, and that in hospital clinics, at least, it is the method of choice.

THE INCIDENCE OF VISCEROPTOSIS.

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AN examination of the literature shows that there is still considerable lack of unanimity concerning the etiology, frequency, and significance of visceroptosis. From our own study of the subject, we have come to agree with those who believe that visceroptosis is very frequently encountered, and that in a large majority of the cases it is congenital, or perhaps, better still, a predisposition to revert to a more primitive type. While acquired cases no doubt exist, they must form but a small percentage of the total. Faulty dress, corsets, repeated pregnancies, and rapid loss of weight play but a minor part, if any, in the etiology. We have frequently had occasion to examine multiparae, with relaxed abdominal walls, without finding any evidence of ptosis. The same is true following rapid loss of weight. We have encountered the condition in children of both sexes.

Apparently, we have not yet reached that stage of evolution in which our organs are ideally supported. Whereas, in the four-legged stage, the spine forms a satisfactory support for the viscera, in the upright position, on the other hand, it fails to perform this function properly. Ptosis, then, is a condition in which

the organs sink to a lower level in the abdomen than we are in the habit of calling normal. Almost all the viscera, especially the stomach, tend to be long and narrow, and to conform to the general type of the body.

It is to be hoped that with the popularization of the x-ray for routine clinical examinations, and with the adoption of standard uniform methods of investigation, this subject will be adequately studied in the near future, and that many of its mooted questions will be satisfactorily answered.

It is our object, in this paper, to present as objectively as possible a brief statistical review of material that has been collected during the past four years.

Material and Methods. The ultimate basis for this study is a consecutive series of 1600 private patients complaining of "stomach trouble." It may be well to explain at the outset that by no means all of these individuals had actual lesions in the digestive tract. Many, as might be expected, were suffering from disturbances of other systems, such as the pulmonary, cardio-renal, nervous, etc. Of this total, 898 were subjected to a routine x-ray examination. This consisted, as far as the digestive tract is concerned, in the examination of the patient at intervals after the administration of an opaque meal. In the earlier cases, 50 gms. of bismuth carbonate was used, later 100 gms. of barium sulphate. This was mixed either with 300 gms. of cereal or 500 cc. of buttermilk. In accordance with the findings of others, our results were practically the same whichever combination was used.

The diagnosis of ptosis was made from the fluoroscopic and radiographic examinations. For the sake of more ready comparison with the results of others, we have grouped as ptotic those stomachs whose lowermost point (taken when filled as above described, the patient standing), reached more than 2.5 cm. (one inch) below a horizontal line joining the top of the iliac crests. All our calculations have been worked out on this basis. However, we feel that a more conservative and perhaps safer standard would be to diagnose ptosis only when the lowermost point of the gastric shadow reaches more than 5 cm. (2 inches) below the interiliac line. The smaller group, based on this reading, constitutes 72% of the larger, and our absolute figures may, in fact, be correspondingly excessive. We believe, however, that our *relative* findings would not be found materially changed, should they be worked out for the more severe cases only.

General Incidence. In our series of 898 x-ray cases, gastropptosis occurred 579 times, a general percentage incidence of 64.4. If the alternate reading be adopted (*i.e.* ptosis = descent of more than 5 cm.) the incidence is 417, a frequency of 46.4%.