and, if we cannot finally conquer, at least prolong for years a life which unaided would have rapidly been sacrificed.

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THE "PANCREATIC REACTION" IN ABDOMINAL DISEASE.

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IN no department of internal medicine is accurate differential diagnosis so called for in the interest of the patient as in diseases and disorder of the abdominal viscera.

This general proposition is, I think, fully accepted by my surgical colleagues, for the immature period of the exploratory laparotomy has been succeeded by a desire for accurate diagnosis, so that the abdomen may not be opened unless the prospect can confidently be entertained that the symptoms which justify surgical interposition will be removed. That this highly desirable accuracy in differential diagnosis has not yet been universally attained may be assumed from some recent writings. It surely, however, does not ask for unattainable skill on the part of the physician that an accurate differential diagnosis should be made between primary and secondary gastric symptoms, between disturbances of gastric function and duodenal ulcer, and between gastric catarrh and appendicitis.

In view of the importance to be attached to accurate differential diagnosis in the abdomen, all new aids claiming to further this object demand to be carefully tested and examined. It was with this object in view that, some eighteen months ago, I, for the second time, took up the examination of the urine by Cammidge's method to ascertain whether it would facilitate differential diagnosis in abdominal cases.

The claim of the author of this test was that, with certain reservations, the reaction was indicative of the existence of pancreatitis. This was not merely a new test for a hitherto unrecognized product in the urine, but the presence of this product was claimed to indicate the presence of a certain condition in the pancreas, which condition, in its turn, was placed in the position of a common and serious disease, and recognized as such for the first time. We were, in fact, brought face to face with what was practically almost a new disease. We had before this recognized necrotic, haemorrhagic, and purulent pancreatitis; the metastasis of mumps to the pancreas; of cases of diabetes associated with atrophic cirrhosis of the gland; and the contentions relating to the islands of Langerhans were well known. But here was a condition suggested to be common and important, which had hitherto escaped notice, the test of its existence being the presence of a urinary reaction.

The Cammidge reaction claimed to be a pancreatic reaction. With such reservations as are usually applicable in clinical work, a positive reaction was to be regarded as strongly suggestive of the existence of pancreatitis.

If this is not to be the claim based upon the reaction, the performance of the test can at best merely be the demonstration of a chemical vagary in the individual; while, if the claim be abandoned, and at the same time the value of the reaction be asserted, we get into a region somewhat outside either the pale of scientific medicine or of logical thinking. The reaction cannot both be and not be a sign of pancreatitis.

In approaching this subject it is necessary to bear in mind that, although the pancreas and the liver are so closely associated anatomically that their ducts may have a common opening in the duodenal wall, their functions are totally dissimilar.

The liver is a great excretory gland, through its biliary function; it is indirectly the same in virtue of the

chemical syntheses effected by its cells in the formation of urea; it protects the body from the action of various toxins in virtue of its detoxicating powers; and by virtue of its glycogenic function it is a centre of stored energy-producing material. Its influence through the bile on digestive processes is relatively insignificant.

The pancreas, on the other hand, is a great secretory gland; it performs no such functions as the liver performs; it is comparable to the salivary glands, not to the liver. Its disturbances affect the value of its secretion, either internal or external. There is nothing else to be disturbed.

The liver, in virtue of the scope of its functions, is exposed to injurious influences vastly more numerous than the pancreas. In neither is injury by extension from the duodenum along the ducts common. Injury to the liver by way of the blood or lymph is common from acute parenchymatous inflammation ending in abscess to slow interstitial hyperplasia ending in cirrhosis.

In the pancreas acute necrotic and haemorrhagic inflammation is known as a highly mortal malady, but it has not been shown that these conditions arise from duct infection; while the cirrhoses of this organ have no known clinical significance apart from the production of diabetes in some instances. Apart, indeed, from the severe forms of inflammation, it may be fairly postulated that other pathological changes in the gland can hardly be expected to do more than influence its secretory function.

Of the internal secretion and its modifications we are still in comparative ignorance, although much suggestive work has been done on this highly subtle question; while as regards the external secretion, diminution or increase in quantity of one or other or of all its ferments can be thought of only as affecting the processes of digestion in the intestine.

There is no failure in excretory function to consider, as such failure has to be reckoned with in hepatic disorder.

Any absorption from the gland must be the absorption of some of its secretion, or of an altered enzyme; and the enzymes are protein bodies, not carbohydrate bodies, and presumably cannot, therefore, be the source of the substance in question.

The clinical pathology of the two glands is thus fundamentally different, and care has to be taken that clinical contentions regarding the pancreas are not based upon an imaginary pathology of the organ.

In the investigation undertaken I confined myself to the examination of the urine in patients with abdominal symptoms, or definite abdominal lesion, as my aim was to ascertain whether any assistance was to be obtained from the presence or absence of the reaction in making a differential diagnosis. Cases were selected in which it was thought that the reaction might be helpful in one or other direction.

I have tabulated 78 cases which are fairly representative of the types of abdominal cases met with. They are as follows:

TABLE A.—Marked Positive Reaction (4 Cases).

Name and Sex.	Diagnosis.	Reaction.	Remarks.
Veitch (m.)...	Necrotic pancreatitis	Positive, marked	Abdomen opened; died. Decoction of the pancreas gave marked reaction. No other organ similarly tested.
Hay (m.) ...	Necrotic malignant ulcer, size of florin, posterior gastric wall; extensive infarction, and growths in liver	Positive, marked; crystals appeared in ten minutes	Gastric symptoms not marked; patient developed profound intoxication suggestive of severe pancreatic disease. Pancreas showed neither macroscopic nor microscopic change.
Guthrie (m.)	Hyperchlorhydria	(1) Positive, marked; appeared immediately. (2) Positive, medium	Relieved by medical treatment; returned 6 months later with symptoms of gastric ulcer, for which a gastro-enterostomy was done.
Hoggan (f.)...	Pain in abdomen, with profound intoxication (cause unknown)	Positive, marked, and rapidly appearing	Died soon after admission. No post-mortem examination.

TABLE B.—Hepatic Cirrhosis; Gall-Stone Colic; Catarrhal Jaundice (12 Cases).

Name and Sex.	Diagnosis.	Reaction.	Remarks.
Welsh (f.) ...	Cirrhotic liver and ascites	Positive	Died.
Greig (m.) ...	Cirrhotic liver and ascites	Positive	Ascitic fluid positive.
McKay (f.) ...	Cirrhotic liver and ascites	Positive	Died; ascitic fluid positive.
Result: 3 positive and ascitic fluid positive in 2.			
Keddie (f.) ...	Gall-stone colic	(1) Positive (2) Negative	Operated on second time and stones removed.
Cairns (f.) ...	Gall-stone colic and tender gall bladder	Positive	Operated on, stones removed.
Slater (f.) ...	History of gall-stone colic	Negative	Improved.
McGruer (f.) ...	History of biliary colic and constipation	Positive	Cured.
Henderson (f.)	Gall-stone colic	Positive	Left hospital.
Henderson (f.)	Readmitted	Negative	Stone removed.
Private (f.) ...	Hepatic colic	Positive	Latent case.
Hanley (f.) ...	Gall-stone colic	Positive	Stones found in faeces.
Result: 6 positive, 3 negative.			
Trail (f.) ...	Catarrhal jaundice	Positive	Cured.
Leveson (f.) ...	Catarrhal jaundice	Positive	Cured.
Result: 2 positive.			

TABLE C.—Gastro-intestinal Cases with Negative Reaction (26 Cases).

Name and Sex.	Diagnosis.	Reaction.	Remarks.
Davidson (f.)...	Constipation and chorea	Negative	Cured.
Johnstone (f.)...	Constipation	Negative	Cured.
Forest (f.) ...	Constipation	Negative	Cured.
Kennard (f.) ...	Gastric symptoms, tenderness and constipation (? pancreatitis)	Negative	Cured.
Cameron (f.)...	Obstinate vomiting	Negative	Cured.
Burrell (f.) ...	Gastric symptoms	Negative	
Waiting-room Case	? Pancreatitis	Negative	
McKean (f.) ...	Sent in as gastric ulcer; constipation	Negative	Cured.
Rennie (f.) ...	Dyspepsia	Negative	Cured.
Paris (f.) ...	Constipation and hyperchlorhydria	(1) Negative (2) Doubtful	No iodoform reaction with Sahli's capsules; faeces gave tryptic reaction on serum plate. Improved.
Rooney (f.) ...	Vomiting and diarrhoea; pernicious anaemia	Negative	
Lambert (f.) ...	Recurring diarrhoea	Negative	Cured.
McGovern (f.)	Sent in as duodenal ulcer	Negative	
Gunn (f.) ...	Constipation; migraine	(1) Positive, small; (2) Negative	Cured.
Johnstone (f.)...	Gastralgia	Negative	Suggested gastric adhesions; abdomen opened, nothing abnormal found. Cured.
Davidson (f.)...	Gastric symptoms; severe nausea	Negative	
Vincent (f.) ...	Pain in abdomen: neurasthenic	Negative	
Weddle (f.) ...	Enlarged liver and glycosuria	Negative	Died after leaving hospital. Cured.
Hunter (m.) ...	Hyperchlorhydria; suspicion of duodenal ulcer	Negative	
Russell (f.) ...	Sent in as duodenal ulcer with history of melaena	Negative	Symptoms disappeared.
Robinson (f.)...	Gastroptosis	Twice negative	Gastro-enterostomy; cured. Improved.
Gillies (m.) ...	Gastric symptoms	Negative	
Lawson (f.) ...	Tuberculous stricture duodenum	Negative	Died.
McBeath (f.)...	Tuberculous stricture caecum	Negative	Died.
Private (m.) ...	Duodenal ulcer	(1) Negative (2) Positive, small	Cured.
Private ...	Gastric symptoms	Negative	

TABLE D.—Gastro-intestinal Cases with Positive Reaction (18 Cases).

Name and Sex	Diagnosis.	Reaction.	Remarks.
Todd (f.) ...	Gastric symptoms and constipation	Twice positive, small	Cured.
Fox (f.) ...	Indigestion and constipation	Positive	Cured.
Alexander (f.)	Gastric symptoms and constipation	Positive	Cured.
Reid (f.) ...	Gastric symptoms	Positive	Cured.
Private case (f.)	Great nausea and skin irritation	Positive	
Brown (f.) ...	Obstinate vomiting, neurotic	Positive	Cured.
Mack (f.) ...	Obstinate vomiting, neurotic	Twice positive	Cured.
Knowles (f.) ...	Gastric symptoms	Positive	Improved.
Turnbull (f.)...	Gastric symptoms, previous appendicitis	Positive	Improved.
Lees (f.) ...	Gastric symptoms, sent in as ulcer	Positive	Cured.
Christie (f.) ...	Gastric symptoms	Positive	Former gastrectomy, died.
McDonald (f.)	Duodenal ulcer	Twice positive, small	Gastro-enterostomy, cured.
Allen (f.) ...	Gastric symptoms	Positive	Old gastro-enterostomy.
Gillies (m.) ...	Constipation, tender abdomen, temperature 100°	Positive	Sent in as pneumonia; cured colon lavage in 24 hours.
Coupland (m.)	Gastric symptoms, no free HCl	Positive	Cured.
Rodger (f.) ...	Obstinate vomiting, no free HCl	Positive	Cured.
McKenzie (m.)	Hyperchlorhydria	Positive	Appendix been removed, cured. General health good.
Private (m.) ...	Moderate constipation	Twice positive, small	

TABLE E.—Additional Abdominal Cases (11 Cases).

Name and Sex.	Diagnosis.	Reaction.	Remarks.
Cookie (f.) ...	Tuberculous peritonitis	Positive	Improved.
Patterson (m.)	Addison's disease	Positive	Improved.
M'Pherson (m.)	Localized empyema, right base	Positive	Question whether above or below diaphragm; cured.
M'Lennan (m.)	Bacilluria	Positive	Cured.
Gordon (m.) ...	Retroperitoneal sarcoma	Positive	Abdomen opened; died later.
Young (m.) ...	Gastric cancer, fundus	Positive	Abdomen opened; died later.
Gilhooley (f.)	Tuberculous stricture, caecum	Positive, small	Operated on successfully.
Robertson (f.)	Anaemia and septicaemia	Positive, small	Cured.
Honeyman (f.)	Diabetes	Positive	Improved.
Private (m.) ...	History, attack of appendicitis	Twice positive	Health good, but appendix removed as going abroad.
Private (m.) ...	Subacute appendicitis and dyspepsia	Positive	Appendix removed.

TABLE F.—Cases in which Several Examinations were made (3 Cases).

Name and Sex.	Diagnosis.	Reaction.	Remarks.
Private (m.) ...	Slight gastro-intestinal trouble	Twice negative Twice positive, medium Thrice positive, small	Previously operated on for liver abscess and for cholecystitis, both successful.
Private (m.) ...	Localized colitis	Twice negative, Thrice positive, medium Once doubtful	Cured.
Private (m.) ...	Hyperchlorhydria with gastric dilatation	Once negative, 4 times positive, small	Cured.

TABLE G.—A Few Checks (5 Cases).

Name and Sex.	Diagnosis.	Reaction.	Remarks.
Male ...	Arterio-sclerosis	Thrice positive Once negative	Pancreas normal on <i>post-mortem</i> examination.
Physician (K).	Normal state	Thrice positive	
Physician (D).	Normal state	(1) Positive (2) Negative	
Physician (R).	Normal state	Twice positive, slight	
Female ...	Subacute rheumatism	Thrice positive	

In Table A there are 4 cases in which the reaction was not only positive, but marked in amount and in the promptness of its appearance. One case was a case of necrotic pancreatitis, which died, as these cases die, of a profound toxic asthenia. Part of the interest in this case was that the reaction was obtained from a decoction of the gland. Unfortunately the liver was not tested in the same way. This case represents the positive reaction with definite pancreatic lesion, and taken by itself would be very impressive. The second case, however, entirely counteracts this impression. It was the case of a man with not very definite gastric symptoms, who shortly after admission developed a condition of toxic asthenia, and whose urine deposited Cammidge crystals copiously after ten minutes. This patient passed one or two motions involuntarily which contained altered blood, as shown by chemical examination. I discussed this case in a clinical lecture before the patient died, and pointed out the patient's toxic condition as due to some abdominal lesion, which, were the Cammidge reaction to be depended upon, ought to be pancreatitis. The occurrence of melaena, however, was against such a diagnosis, and I suggested that the toxic state was probably due to a condition not even thought of. At the autopsy there was found a small malignant growth on the posterior wall of the stomach which had become a slough, while the liver presented an extraordinary appearance from the presence of not only secondary growths, but extensive necrosis from infarction. The pancreas presented no abnormal change.

Even one such case as this throws out the contention based on the Cammidge reaction; in this case the pancreas was not inflamed, but the condition of the liver and our knowledge of liver function are available readily to explain the presence of any unusual substance present in the urine. If disturbance of liver function can lead to a marked Cammidge reaction, there ceases to be any reasonableness in associating the urinary finding with pancreatic disease.

In Table B there are 3 cases of cirrhotic liver which gave a positive reaction. With the ascitic fluid from two of the cases a positive reaction was also obtained. Two cases of catarrhal jaundice gave a positive reaction. Seven cases of gall-stone colic gave 6 positive reactions and 3 negative.

In Tables C, D and E are tabulated 55 cases, most of them hospital cases, with symptoms referable to disordered gastro-intestinal function, sufficiently severe to require hospital treatment, or with definite lesion. These constitute a series of almost consecutive cases, in many of which it was thought the reaction might be found to be of some diagnostic significance. In 26 of them the reaction was negative, in 29 it was positive; the numbers are thus fairly evenly divided. When the details of these tables are examined it will be understood that in spite of my earnest attempt to find some value in the test I entirely failed to get any indication from it of the existence of a pancreatic inflammation, or even any sure light and guidance as to the state of pancreatic secretion, or of pancreatic digestion.

In Table F there are 3 private patients who were more fully examined and in whom the reaction was of no clinical assistance whatever.

In Table G are given 5 check cases in persons with no abnormal symptoms: one, a case of arterio-sclerosis with normal pancreas, gave three times a positive reaction and once a negative; another, a woman suffering from sub-acute rheumatism, gave three times a positive reaction. Seven observations made on three of the staff (including myself) gave six positive reactions and one negative, and,

so far as we knew, we were all in excellent health at the time.

From these results it is seen that a positive Cammidge reaction may be obtained from the urine of persons in good health; that it may be obtained from the urine of persons suffering from a great variety of abdominal disorder or disease; that it may be present in other diseased conditions; that it may be present when autopsy shows that the pancreas is not the seat of any anatomical change. All this to the physician and to the pathologist definitely excludes pancreatitis as the cause of the Cammidge reaction.

That the reaction is a reliable guide to the condition of the pancreas has not been borne out by our observations; in fact, they seem to negative such a contention.

Even putting pancreatitis out of account, it might still be contended that the substance found in the urine was absorbed from the pancreas; but, as has been said, the pancreatic enzymes are proteid substances, and the substance in question is a carbohydrate. But even were such absorption the source of the substance, we should require to recognize that the absorption took place in so many different conditions, is so variable in amount, and so apparently erratic in the times of its appearance, that its presence as an aid to abdominal diagnosis is entirely negligible, and if depended on may be wholly misleading.

It may ultimately be found that the reaction is of some value as an index to the state of intestinal digestion, but, so far, we have not been able definitely to establish any such relationship.

The substance is probably a pentose, and therefore suggests a carbohydrate source. Its composition does not *a priori* suggest the pancreas as its source, but leads rather to the consideration of intestinal processes and of the hepatic functions. In the intestine there is carried on the transformation of carbohydrates into a variety of products, still imperfectly known, and the absorption of products of fermentation and putrefaction; while there is the possibility of there being more of any one substance than the liver can deal with efficiently, and consequently of leakage into the systemic blood. In this region it seems to me we are on sounder ground when seeking a source for this new urinary constituent.

Passing to the investigations which have been made in Germany, France, and America, one is struck partly with the variety of result obtained in the examinations of a series of cases, but in all it is noted that the reaction is obtained in diseases other than pancreatitis, while others found the reaction absent in pronounced cases of that disease. Some observers set the reaction aside almost with contempt; others are sanguine that it is of value while failing to define its significance. I cannot occupy space with even a summary of the papers published on the subject, but I append a list of those I have looked into. The most excellent paper by a surgeon which I have seen is that by Kehr of Halberstadt. With his conclusions as to when to operate in cholelithiasis I am in complete accord until he decides that the presence of the Cammidge reaction is to determine operation when otherwise he would not operate. This is because he so readily accepts the view that the reaction indicates pancreatitis. When on operating he finds the pancreas large and hard, the necessity for the operation seems to him to have been established. Schumm and Hegler, on the other hand, deny that a pancreas being large and hard indicates pancreatitis, for they claim to have often convinced themselves by histological examination that a very hard pancreas showed a completely normal structure and no increase of fibrous tissue. Going through the literature, one is impressed by the efforts made to belittle the significance of a positive reaction in many cases; to explain away its absence when it would be more convenient were it present; and to depend upon it in other cases as if it never occurred in but one condition, and was an absolute proof of a particular pathological state.

I have no doubt that chemical pathology will determine the source of the substance, and the precise alimentary conditions which lead to its appearance in the urine. Meanwhile the reaction is one of a number of urine reactions which may accompany alimentary error. To claim for it any higher position in the field of diagnosis or of prognosis is not warranted; and from our knowledge of physiological and pathological chemistry, the claim has

the appearance of being devoid of reasonable support. Practically tested, as I have endeavoured to test it, it signally fails.

I am glad to express my indebtedness to my Resident Physicians, Drs. Krause, Deuchars, and Lang Todd, for the careful help they have given me in this investigation.

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ON THE RESULTS OF THE "PANCREATIC REACTION,"

AND ON THE DIAGNOSTIC VALUE OF AN ANALYSIS OF THE FÆCES IN DISEASES OF THE PANCREAS.

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In a paper which I read before the Royal Medical and Chirurgical Society on March 13th, 1906, I described an improved method of performing the so-called "pancreatic" reaction in the urine, and gave my experience of the reaction with 100 specimens derived from 94 cases. I now have records of over 1,500 samples of urine derived from 1,475 cases. The large majority were sent to me by medical men in various parts of the country for diagnostic purposes, and it is owing to their kindness in furnishing me with the results of operations and the after-histories of their cases that I am able to compare my analytical findings with the clinical conditions present in most of them. I take this opportunity of thanking them for their courtesy and ready response to my letters of inquiry.

The cases may be divided into eight main groups:

I.—ACUTE PANCREATITIS.

All the 13 cases in this group gave a positive pancreatic reaction; 6 were operated on, and the pancreas was found to be acutely inflamed in all, with disseminated fat necrosis in 5. The diagnosis was confirmed by *post-mortem* examination in 3. Gall stones were discovered in the common bile duct of 2. One had a history of repeated attacks of jaundice with spasm, and had probably suffered from common duct cholelithiasis, but there was no jaundice at the time of the analysis. In 3 the pancreatitis was the sequel of an attack of mumps, but in 4 other cases of the same disease the urine gave no reaction. Two cases gave a history of indigestion and abdominal discomfort extending over several months previous to the attack. Three of the patients operated on died, and 3, including the 2 in which gall stones were found, recovered. All the patients not operated on died, except the 3 in which the pancreatitis followed mumps.

II.—CHRONIC PANCREATITIS.

Chronic pancreatitis is rarely, if ever, a primary disease, but when once it is established it is liable to steadily progress, and may seriously interfere with the metabolic processes of the body, eventually leading to glycosuria in some cases. To merely make a diagnosis of chronic pancreatitis is not enough, the primary cause of the condition must be determined if a successful line of treatment is to be pursued, and by considering the clinical condition together with the results of an analysis of the excreta this can generally be done.

The causes of chronic pancreatitis are numerous, but many of these are rare. I have divided my cases into the following classes:

1. Associated with Gall Stones or Local Malignant Disease.

I have examined specimens of urine from 264 cases in which gall stones were found at operation, and of these

149 (56 per cent.) gave a positive reaction. In 183 cases the gall stones were in the common bile duct, and of these 131 (69.6 per cent.) gave a positive and 57 (30.4 per cent.) a negative pancreatic reaction—percentages which correspond fairly closely with the proportions of cases in which the common bile duct lies embedded in the pancreas (62 per cent.) and runs in a groove on the surface of the gland (38 per cent.) On dividing these cases into groups according to whether bile was or was not detected in the urine, it is found that out of 128 with jaundice 91 (71 per cent.) gave a positive pancreatic reaction, and out of 60 non-jaundiced cases 40 (66.6 per cent.) gave a positive result.

A more or less marked reaction for urobilin is a most useful indication of the probable presence of gall stones in the common bile duct, especially when they are "floating." In this series of 188 cases it was met with in 123 (65.4 per cent.), being more common where the calculi did not give rise to jaundice, namely, 47 cases (78.3 per cent.), than in those in which there was obstruction of the bile flow, namely, 76 cases (59.3 per cent.). A deposit of calcium oxalate crystals was met with in 69 per cent. of those cases in which there was evidence of pancreatitis. Nine of the cases in this group which had given a positive pancreatic reaction during life were examined *post mortem* and the diagnosis of chronic pancreatitis confirmed microscopically. Specimens of urine were obtained after operation in 24 cases, 20 having previously given a positive reaction. In 14 the reaction was found to have disappeared at intervals varying from one to four weeks after the operation, but in 6 it still persisted when the last analysis was made.

Thirollox and Maugerot¹ have maintained that cholecystitis is a common, if not the commonest, cause of pancreatitis, the inflammation spreading by way of the lymphatics from the inflamed gall-bladder to the head of the pancreas. My experience does not confirm this, for out of 76 cases in which gall stones were found in the gall bladder or cystic duct at operation only 18 gave a positive pancreatic reaction and were stated to have pancreatitis; 58 gave a negative result, as did also 17 cases diagnosed clinically as cholecystitis, 6 of which were operated on, that I have included in the miscellaneous group. Bile pigment was found in the urines of 11, including 9 of those that gave a positive pancreatic reaction; 15 gave a reaction for urobilin, and of these 10 gave a pancreatic reaction. Calcium oxalate crystals were met with in the deposit from the urines of all those that gave a positive pancreatic reaction, and in 4 of those with which no reaction was obtained.

A positive pancreatic reaction was given by the urines of 2 out of 8 cases of malignant disease of the common bile duct, and 2 of growth at the ampulla of Vater. Only 1 of the 10 cases in this group gave a reaction for urobilin, and in this the liver was being invaded by the growth.

2. Secondary to Intestinal Disease and Gastric or Duodenal Ulcer.

Chronic pancreatitis is, I believe, most commonly secondary to diseases of the intestine. In most cases there is probably an infection of the pancreatic ducts by direct extension from the duodenum, the pancreatitis being primarily of the catarrhal type. This group includes 403 cases in which the clinical symptoms and results of the analysis of the urine and faeces pointed to there being disease of the intestine other than a malignant growth. Of these the urines of 211 (52 per cent.) gave a positive pancreatic reaction.

The explanation of the presence of a pancreatic reaction in about two-thirds of the cases of intestinal catarrh or enteritis I have examined is, as I have explained, probably an inflammatory condition of the pancreas due to an extension of the catarrh of the intestinal walls along the pancreatic ducts. A similar explanation also probably holds good for those cases of colitis and appendicitis in which a reaction was obtained, for in many instances these conditions are associated with a more or less marked pathological state of the entire length of the intestinal tract. A considerable number of the cases which I have included under the heading of "intestinal catarrh" had in addition some colitis, as an analysis of the faeces showed, but the disease was evidently not very marked clinically, as it was not mentioned in the reply I received to my letter of inquiry. Hyperchlorhydria, as I pointed out some time