RÉSUMÉ.

To sum up briefly, and looking at the subject from a little different point of view, we see from the above, that an abnormally large quantity of urine is passed in advanced convalescence from acute nephritis, in chronic interstitial nephritis, in amyloid degeneration of the kidney, generally in chronic diffuse nephritis, and in some cases of active hyperæmia of the kidneys. An abnormally small quantity of urine is passed in the early stage of acute nephritis, both active and inactive stages of subacute (or chronic parenchymatous) nephritis, generally in active hyperæmia, and always in passive hyperæmia of the kidneys. Toward death, of course, we find an abnormally small quantity of urine in all forms of kidney trouble.

A large amount of albumin, by which I mean one-half per cent. or more, is found in the urine only in the early stage of acute nephritis, the active stage of subacute (or chronic parenchymatous) nephritis, and, sometimes, in the chronic diseases complicated with these. A moderate amount of albumin, about one-quarter per cent. we find in early convalescence from acute nephritis, in the inactive stage of subacute (or chronic parenchymatous) nephritis, in advanced chronic interstitial disease and in amyloid degeneration of the kidneys, generally in chronic diffuse nephritis, for a few days in severe active hyperæmia (catarrhal nephritis), and in very rare cases of passive hyperæmia of pregnancy. Only very slight traces of albumin are found in advanced convalescence from acute nephritis, in the early stages of chronic interstitial and amyloid disease of the kidney, and, generally, in active and passive hyperæmia of the kidneys.

Blood is found in the sediment, free and adherent to the casts, and often with blood casts, only in acute nephritis and active hyperæmia, or other affections which are complicated with these. Fatty elements, fatty renal cells, fatty casts, or oil globules free and on casts, are found temporarily in acute nephritis, being most abundant in the early stage of convalescence; during the whole progress of a subacute and chronic diffuse nephritis, and in some cases of long-continued active hyperæmia of the kidneys, generally, however, in very small proportion in this last affection. The presence of calculi in the renal tissue, or the existence of cancer or other morbid growths affecting the kidney, produce more or less parenchymatous inflammation in those portions of the renal tissue affected, and we will consequently find on examining the urine and sediment in such cases some evidence of the parenchymatous inflammation. Generally, the urine resembles that of an active hyperæmia of the kidneys, but we may find in the sediment, in addition, crystalline elements, if there is a concretion, varying in character according to the nature of the concretion, or in cases of morbid growths rarely pieces of the growth or cells from it. Tubercular disease of the kidneys causes suppuration, and may be detected by finding the tubercle bacilli in the pus.

AN ARKANSAS METHOD OF TREATING SMALL-POX. — A simple and effective method of stopping the spread of small-pox was tried in a rural district of Arkansas last week. A negro being found ill with small-pox in his cabin, the neighbors set fire to the house and burned it all up — small-pox infection, cabin and negro.

Original Articles.

APPENDICITIS: SOME IMPRESSIONS DERIVED FROM AN EXPERIENCE OF 44 CASES.¹

BY HOMER GAGE, A.M., M.D., WORCESTER, MASS.,
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OUR knowledge of the frequency and importance of inflammation of the vermiform appendix and its results dates back in this country to the paper of Fitz, read before the Association of American Physicians in 1886. From a purely pathological study, he demonstrated beyond all dispute, not that appendicitis was a new disease, but that it had always been the unrecognized cause of a great variety of acute abdominal diseases, hitherto classed as inflammation of the bowels, peritonitis, typhlitis and perityphlitis. His conclusions have been since then confirmed and strengthened by a constantly increasing surgical experience. Dr. M. H. Richardson, whose 281 cases lately reported represent one of the largest individual experiences, expresses the opinion that at least 90 per cent. of all cases of acute peritonitis occurring in young adults originate in an inflamed appendix, an estimate which is, I think, not likely to be diminished by further investigation. Dr. Richardson further expresses his firm conviction that "excluding certain zymotic diseases, it is the cause of more deaths than any other acute abdominal lesion." No surgical subject has within recent years attracted so much attention or given rise to so much discussion. Its frequency and importance have been strenuously urged on all sides, and very large and constantly increasing personal experiences have been reported. It is confined to no localities, to no conditions of life. The picture it presents is being recognized by the profession everywhere as an old acquaintance under a new name.

In spite of all the discussion, and the large experience so rapidly acquired, the problems created by the newly discovered pathology are by no means finally solved. No one can lay down any rules by which we can be governed in diagnosis, prognosis or treatment. We must, for a time at any rate, be content to be observers only. He who studies and observes much, finds his opinions changing so often that he is very reluctant to attempt the instruction of others. One opinion alone I find not changed but strengthened from the beginning, that is, as to the gravity and danger that exists in every case, no matter how mild it may appear to be. This one fact I would impress upon you; for the rest, I have preferred to give you briefly some impressions as they have been made upon my mind by the study of these 44 cases, asking you to remember that I regard them as impressions only, which are still subject to change, but from which further study and experience will, I hope, evolve more definite conclusions.

In the 14 cases in which the appendix was removed, a fecal concretion has been found three times, twice in the appendix itself, once in the bottom of the abscess cavity. I have never found any other foreign body present. In three cases, traumatism was the alleged cause, and in one the attack followed the ingestion of large quantities of grapes. In a very few instances, the attack was preceded by diarrhoea, with

¹ An address delivered before the Thurber Medical Association at Milford, Mass., February 22, 1894.

acute digestive disturbance; but for the great majority of all cases — I should say at least 75 per cent. — no cause could be assigned. I do not believe that the preponderance of males, in my own series 35 out of 44, can be fairly interpreted to indicate hard labor or exposure to injury as a predisposing cause. My own feeling is that the cause is usually to be found in the accidental retention in the appendix of larger or smaller faecal masses, and that their effect is determined by the kind and virulence of the bacteria present with them. Another determining factor is probably to be found in the congenital or acquired variations in the length, position and patency of the appendix. These variations are of still more importance from their effects upon the clinical history and symptoms of appendicitis.

The appendix is ordinarily from two to four inches in length, although considerable variations in both directions have been occasionally noted. Its base is fixed near the ileocaecal valve, at the junction of the longitudinal striae of the colon, and is therefore subject only to such changes in position as affect the caecum as well. From this point, however, the appendix and its mesentery may lie in almost any direction, extending downward into the pelvis, transversely across the abdomen, with its tips reaching beyond the median line, or upwards on either side of or even behind the ascending colon. Its position, of course, fixes the location of pain and tenderness, which may, therefore, be found almost anywhere within the abdominal cavity. Many cases of appendicitis are thus the more readily mistaken for cases of peritonitis of ideopathic or unknown origin, a diagnosis that occasionally seems to be verified by a fruitless search for the appendix at the time of operation. Allow me to cite one example from my own experience.

E. E., grocer, thirty-five years old, patient of Dr. George F. Woodbury, was seen December 18, 1891. He had a history of a previous attack in August, 1891, since which time he had constantly complained of pain, chiefly epigastric, for which he sought counsel in Boston. Present attack came on suddenly in the night, and on account of absence of local signs, I advised delay, until on the 20th it was clear that a general peritonitis was impending. At the operation, peritoneum was everywhere injected and there were some fibrinous adhesions, but no pus and no appendix could be found. The patient died two days later; and at the autopsy, the appendix was found lying behind the caecum and extending upwards about four inches, its tip resting on the right kidney. Its end was perforated, and pus could be squeezed out of its entire length, and had already formed a small abscess between the colon and the kidney.

Here was an appendix which had given rise to pain chiefly in the epigastrium, and which from its concealed position had almost escaped detection, and could not have been removed. I believe that the most favorable position for finding the appendix is when adherent to the iliac fascia or along the outer side of the colon. From these places it can almost always be removed, because the general peritoneal cavity can be more easily and more perfectly protected, and because the dissection can be prosecuted with a greater sense of security; one has a better view of the field of operation, and there is less danger of injuring important structures.

Dr. Richardson has lately raised the question as to

whether or not the appendix is always perforated, and expresses his "strong conviction that in all severe cases, and, in fact in all cases where there is a localized peritonitis there is a larger or smaller perforation with extravasation." Without wishing in the least degree to question this statement, it seems to me that there must be a few exceptions. I have twice removed appendices in which no perforation could be discovered by the naked eye or by the probe. (Both specimens are shown here.) The first is from a man who had had three previous attacks, and whom I operated upon forty-eight hours after the beginning of the fourth. Upon separating an adherent mass on the inner side of the colon, I succeeded in isolating the appendix, which was very much thickened, its surface red and slightly injected. There was no pus. Immediate improvement followed its removal. The second is from a young man who had been sick five days, complaining chiefly of pain in the right iliac region. The appendix was found non-adherent, somewhat thickened, with a bulbous tip, which was directed forward against the abdominal wall, and corresponded with the point of maximum tenderness. Microscopical examination of its contents showed that it contained a faecal concretion with a small amount of pus. In both of these cases, the inflammatory process, which always begins from within, in the mucus membrane, had extended outward, involving successively all the coats of the appendix and ultimately would have perforated it, perhaps. Neither perforation nor extravasation had, however, taken place up to the time of my interference. The first was certainly one of the severest and most threatening of my cases, and the second was rather a late operation.

The most important pathological factor is, I think, the limitation of the process by protective adhesions. They may be formed by the adherence of adjacent coils of intestine, by the envelopment of the appendix in a fold of omentum, or by its adherence to the iliac fascia, or along the outer side of the colon, as before mentioned. At any rate, the result is a localized abscess, which may or may not be adherent to the abdominal wall. Should extravasation take place before the formation of adhesions, a general infection follows, and the case cannot be distinguished from what has always been called idiopathic general peritonitis.

The typical case of appendicitis presents a picture so familiar to us all as to require but little attention. A child or young adult suddenly seized with abdominal pain and vomiting, the pain at first general, then more marked in the right iliac region, accompanied by tenderness, and in the course of time by the development of a bunch. This is the type, from which, however, there may be wide variations. The onset is almost always sudden. Chills or chilly sensations may be present, but are just as often wanting, even when suppuration has taken place. Vomiting is often, though not necessarily, an early symptom, and when present usually ceases with the localization of the inflammatory process. Its continuance, especially if changing to simple regurgitation, is always ominous. I have, however, recently had two cases in which, after the removal of the appendix and drainage of the abscess, vomiting of a thin, dark-green fluid persisted for several days, both patients ultimately recovering.

The pain is at first general and then local. It may be very severe, or quite moderate, in cases which at operation present very similar conditions. Its loca-

tion is, I think, of but little value, because the position of the appendix varies within such wide limits. Absence of localization is important as indicating a more general infection of the peritoneal cavity. Tenderness, like pain, may be general or local, and in any part of the abdomen. With the appendix in its ordinary place, the point of maximum tenderness is, as indicated by McBurney, usually to be found midway between the anterior superior spine and the umbilicus. The exceptions to this are, however, nearly as many as the observances, and I think McBurney's point as a diagnostic sign should be altogether discarded.

Dulness, when present, helps to the localization of the inflammation, but its absence is entirely without significance. Its value in any case is extremely limited. Abdominal distention, especially if general, is, I believe, one of the most dangerous symptoms. Fortunately, it is not an early one, and can generally be anticipated by operation. Its presence not only indicates a more or less general peritoneal infection, but also offers a serious obstacle to the mechanical part of the operation. The effect of its full development I shall refer to again.

Temperature I have come to regard as of but little value in indicating the nature or severity of the attack. I have operated in the face of a normal temperature for two days, and found a foul abscess with double perforation of the appendix, and, on the contrary, with a temperature of 103° , have found no pus, and simply an inflammatory thickening of the appendix. It is certainly a much less reliable guide than the pulse, and I am inclined to agree with Elliot that many of the most serious cases have a normal or nearly normal temperature.

One of the most interesting problems in connection with the clinical history of these cases is their tendency to recur. How great that tendency is cannot yet be accurately stated. Fitz found it in 11 per cent. of 257 cases. Out of the 44 cases which furnish the basis of my paper, 12 gave a definite history of two or more attacks. It is safe to say that in the very large proportion of cases the first attack is the last, but that after one or more recurrences others may be pretty certainly expected; and one thing is, I think, pretty definitely settled, namely, that one can never tell how severe the next attack may prove. A patient who has had one or more recurrences is in constant danger of an attack so severe as to be beyond surgical help from the outset.

One word about the differential diagnosis: it is not always easy to distinguish appendicitis from other acute abdominal affections. When the local symptoms are not clear, internal strangulation, twists and intussusception, with other forms of intestinal obstruction, must be carefully considered, and the operator must, of course, be prepared for any one of them. Dr. Richardson reports two cases of strangulation in omphalo-mesenteric remains which were mistaken for appendicitis. In one case of suspected appendicitis which I saw with Dr. W. E. Paul, then of Southbridge, and which he has lately published in the *Boston Medical and Surgical Journal*, operation was deemed inadvisable because the patient was already moribund. Autopsy revealed a hæmorrhagic pancreatitis as the cause of death. Many of these conditions can be eliminated only by exploratory incision, bearing in mind always that in healthy young adults, especially males, a sudden attack of acute abdominal pain,

with attendant symptoms pointing to the development of a local or general peritonitis, means in the great majority of cases an inflamed appendix.

In considering the management of these cases, let me say a word first about medical treatment, especially treatment by salines, so strenuously urged by Dr. Gordon, of Portland. Since the revival of saline treatment of peritonitis by Tait, we have all seen at times in appropriate cases most satisfactory results. The theory of its benefit, as suggested by all of its admirers, as well as by Gordon, lies in its depletive effect, not only upon the general, but also upon the portal circulation; the free watery dejections at the very beginning of the trouble are believed to cause the absorption of exudates before they have a chance to undergo decomposition, and also to subdue inflammation by their local depletion of the blood-vessels. The advantages of this method are obvious if its safety can be demonstrated. The dangers are from the breaking down of protective adhesions by increased peristalsis, and from favoring the extravasation of the intestinal contents through the perforated appendix. The first objection is, perhaps, somewhat theoretical; but the delicacy of the adhesions, and the ease with which they are ruptured during most careful manipulations, are familiar to all who have seen early operations. I have seen one case in which the adhesions which separated a localized abscess in a child were ruptured during sleep, and another in which in a young adult the rupture took place during an effort at stool; in both cases the disappearance of the local swelling was accompanied by collapse, rapidly progressing general peritonitis and death. In the second case, the abdomen was opened ten hours after the accident, a large quantity of pus lying free in the abdominal cavity evacuated, but too late to be of any service. This danger is not only theoretical, but real and very much to be feared. That salines may promote further extravasation of intestinal contents through the perforated appendix is denied by Dr. Gordon, on the ground that at the onset of the attack communication is shut off between the cæcum and appendix by closure of the natural opening. His statement is unsupported by any anatomical demonstration, and is contradicted by the published records of almost all the leading authorities upon this subject. At the recent meeting of the Surgical Section of the Suffolk District for the consideration of this subject, Drs. Richardson, Beach, Cabot and Elliot all testified to finding fæcal matter in peri-appendicular abscesses and in the appendix itself, and at least two of them testified to having seen gas and intestinal contents escape from the perforation at the time of operation. I have myself found fæcal matter in the appendix, and have twice after ligation and removal of the appendix, where there was no possibility of cæcal perforation, had fæcal matter discharged through the drainage-tube on the first two or three days, and not thereafter. I believe it can be accounted for only on the ground of direct communication between the cæcum and appendix. In spite of its advantage, therefore, I believe the indiscriminate administration of salines in appendicitis is attended with the gravest danger. I have once or twice resorted to salines, or, preferably, other laxatives, but only in the most guarded way, and in cases where I felt reasonably sure that perforation had not taken place.

For the mildest cases, and where for any reason

temporizing has seemed best, I believe the old-fashioned treatment by rest, opiates and hot applications to be the safest. The so-called simple catarrhal inflammation without perforation will improve as quickly and as surely under this as under the more active methods, the only danger is in concealment of graver symptoms which might demand interference by the opiates, and this has the advantage of being entirely within our control.

It is as impossible with our present knowledge to determine what proportion of cases will recover under such palliative measures as I have just described, as it is to lay down any rules for surgical interference. We do know that while a very considerable proportion of cases recover perfectly and permanently without the necessity of interference, an equally large number, beginning in precisely the same way, quickly develop most dangerous symptoms, which demand at once prompt incision and exploration. Until we discover some way to distinguish at the outset between these two classes, it is natural that those whose experience has been more largely with the severe type should prefer and advocate immediate operation as soon as the diagnosis is established. It is argued that the danger from an operation at such a time is extremely small and that the conditions have not yet been complicated by the presence of large exudations and by strong adhesions, so that they are more easily recognized and more securely dealt with. The argument has much to commend it, and I think there can be no question that the trend even of the most conservative surgical opinion is towards a more rather than a less radical procedure. We are, however, but in the infancy of our knowledge of this subject, and I feel hopeful that we may some time be able to draw at least a sharper line between those cases whose natural tendency is to recovery and those which are destined to progress. There is at best some risk of disseminating an inflammation which nature has attempted to localize, and much danger of weakening the abdominal wall, a very serious consideration, especially to the laboring class. I have not therefore, as yet, been convinced that operation is always to be advised at the very beginning of the attack, and yet in some cases I should propose it unhesitatingly, especially in those where a general peritonitis seemed imminent.

I wish I might be able to give you the exact reasons which govern me in forming such a conclusion, but I cannot. Impressions, even if founded on experience, which cannot be formulated into words, are, I know, most unscientific and unsatisfactory, perhaps, often unsafe guides; but they exist, and I cannot yet at all accurately describe them.

Whenever vomiting continues and is accompanied by any suspicion of increasing distention after the first twenty-four hours, I am sure that interference cannot be proposed too quickly. It generally indicates a greater or less tendency to general peritoneal infection, and its persistence is a symptom of very grave import. The more nearly does it approach a condition of regurgitation, the graver does it become. In these cases, operation must be done in the very beginning, to be of any value. Patients who are regurgitating a dark-greenish fluid, even if not stercoraceous, and whose abdomens are much distended, are the worst possible subjects for operation. I have operated now four times under such conditions, and always with fatal result. Whenever general peritonitis is threatened, operation

must be done within the first twenty-four or forty-eight hours, and even then may be too late to avert death. After full development, operation is, I believe, counter-indicated, and the chance of a favorable result lies in the use of salines or other purgatives, with opiates enough to secure quiet. These are the cases in which the rectal tube, turpentine, enemata and other means for the relief of distention are indicated. In all cases of acute appendicitis, with or without localized symptoms, where a general peritoneal infection is feared or its beginning suspected, the time to consider surgical interference is, I believe, at the very outset. It is then that any delay is most dangerous. When fully developed, it is, I believe, almost always too late. The shock of ether, and the increased manipulation made necessary by distention of the intestine is almost always fatal, and if left to nature, such cases may occasionally recover. I have recently twice had that fortunate experience.

When after the first onset the symptoms become definitely localized with the formation of a tumor, and with a definite sense of local resistance and tenderness, delay may be less dangerous, and the appropriate time for interference is always more difficult to determine. Should the local conditions decidedly improve on the second day, it is, I think, fair to infer that nature will effect a complete restoration, or that she has, at least, succeeded in setting up a temporary barrier to the extension of the inflammation. I believe that there are many cases in which the improvement in physical signs, as well as in constitutional symptoms is so rapid and so decided that interference, if proposed at all, is to be considered only as a safeguard against possible recurrence. In the great majority of these cases of acute appendicitis, where the process is distinctly localized, I believe the most favorable time for interference is as early as the third day. The risk of delay seems to me much greater than the danger of early operation. The second and third days eliminate the mildest cases; the others may assume a far more dangerous aspect with little or no warning. Even as early as this a gangrenous condition of the appendix may be found, around which an abscess has already been formed. This has been the condition in three of my cases.

The first, N. C., male, seventeen years old, was seen in consultation with Dr. J. O. Marble, of Worcester, on the 30th of January, 1893. The attack began with severe abdominal pain and vomiting on the 28th, and I operated sixty-four hours later, that is, on the third day. His pulse was 120, temperature 102°, and his general aspect was exceedingly bad, though he professed to feel better. Upon opening the abdomen, I came at once upon a mass of gangrenous omentum, the meshes of which were infiltrated with pus. Just beneath this was an abscess cavity, containing about four ounces of very foul pus, lying in which was the appendix, perforated about two inches from the cæcum and gangrenous about the perforation. (Specimen shown.)

Again on May 3d, I operated on Mrs. M., twenty-seven years old, a patient of Dr. F. G. Fay, of Worcester, who had been suddenly seized with acute abdominal pain on the evening of the 30th of April; the operation was, therefore, on the third day. The general peritoneal cavity was opened and a mass of adherent coils of intestine found in the cæcal region, not adherent to abdominal wall. On separating the adhe-

sions, about two ounces of pus was evacuated, and the appendix found perforated and gangrenous. (Specimen shown.)

On October 3d, I operated upon A. W., male, twenty-one years old, who was referred to me by Dr. Leonard White, of Uxbridge. His attack began suddenly on the morning of the 20th. Incision revealed pus just below the cæcum, with a much thickened appendix, so adherent that it was torn across at the point of perforation, and only about one inch was removed. The rest was ligatured and left.

These three cases illustrate the severe conditions which may be found as early as the third day, even when the inflammatory process has been definitely limited by adhesions. I believe all would have been more difficult to manage, and more dangerous to the patient had there been even twenty-four hours longer delay. As it was, all recovered.

The most serious objection to early operation is the danger of breaking down adhesions, and defeating nature's attempt to localize the peritoneal infection. Larger experience and greater familiarity with the conditions to be found must diminish very much the force of this objection. It is also, I think, far outweighed by the greater facility in operating, the greater ability of the patient to withstand shock in the early stages, and by the increased chance of doing a thorough and complete operation. I am one of those who believe that the operation is every way more satisfactory when completed by the removal of the appendix, and that whenever possible this ought to be done. I am sure that when it can be done without too great violence to the adhesions, convalescence is established more quickly, is less liable to interruption and recovery is much more certain to be permanent and complete. I have accomplished it now in 14 cases, with 13 recoveries. The only death was in the first case in which I removed it. I would not, by any means, convey the impression that its removal should always be attempted. In the ordinary late operation, it cannot often be found, and even when found, its removal is usually impossible, so tough and firm are the adhesions in which it is imbedded. It is to be undertaken only in early operations, when the adhesions are light and easily separated, and when the general peritoneal cavity can be fully protected. In cases thus properly selected, the removal of the appendix makes a more finished operation, adding very little if any to the immediate danger, and adding much to the rapidity and permanency of the recovery.

So, also, with regard to the omentum, when it is found wrapped about the appendix or involved in the mass of adhesions, if it is gangrenous, or infiltrated with pus, or engorged with extravasated blood, so that it looks like a piece of liver, I would always ligate and remove it. I have done it for all of these conditions, without in any way complicating the operation, and I think it removes a source of considerable danger.

I have not spoken of the operation between the attacks, because my own experience has been entirely with acute appendicitis. In recurrent cases, I believe most heartily in operating during the interval of quiescence, but I have had no experience of my own. In two operations done during exacerbation, in cases of recurrent or chronic appendicitis, I have, however, seen conditions which I have found nowhere described and which seem to me exceedingly interesting.

This first was in a boy thirteen years old, who in

the preceding four months had had several attacks of appendicitis with very short intermissions, and who for a month past had had a small hard tumor, very tender, in the right iliac region. Each attack would begin with pain in the region of the tumor, vomiting, and a temperature rising to 101° or 102°. With rest in bed, counter-irritation and careful attention to diet, each attack would quickly subside, but the bunch had remained. I saw the boy during one of these exacerbations, regarded the case as one of localized abscess, and, as he was a near relative of mine, I asked Dr. M. H. Richardson, of Boston, to perform the operation. He, too, was convinced of the presence of pus, but incision revealed a hard mass of firm, tough adhesions, which were separated so as to expose the cæcum, but no pus and no appendix were found. The cavity was packed with gauze, and healed without suppuration, the boy regained his former health and strength, the bunch entirely disappeared, and there has been no recurrence during fifteen months that have passed. In October last I had an almost precisely similar experience in a Swede twenty-seven years old, who had symptoms off and on for eight weeks, with a well-defined tumor for at least a month. I operated in the midst of an exacerbation, found no pus, and only a hard mass of inflammatory exudation, imbedded in which was the cæcum. So firm were the adhesions that I did not dare attempt their further separation to search for the appendix. The man made a good recovery and has remained well.

These cases illustrate the difficulties that may be met with in what promise to be the simplest operations, and they are especially interesting to me, because I cannot understand the conditions which have caused them, nor the apparently beneficial effect of exposing and disturbing them.

With regard to the results in cases of appendicitis, very little can, I think, be learned from any one individual experience; and until we have some accurate method of classification, we can learn little from the study of compiled statistics. Of my own cases there were 12 not operated upon, 5 of whom died; 4 were in a condition which seemed to me to render operation useless, and the 5th died from internal rupture of the abscess. One of the cases that recovered, died three months later from a recurrent attack. In the 32 operations, there were 25 recoveries and 7 deaths. Of the latter, five were from the continuance of general peritonitis which was present at the time of operation, one was from pyæmia in a late operation upon a large localized abscess, and one was after an operation done for rupture of an abscess into the general peritoneal cavity.

In the 25 cases that have recovered, I have as yet had no rupture through the cicatrix of the wound. I believe, however, that this is only because sufficient time has not yet elapsed; that hernia will come in some at least, I feel perfectly sure. It must come, especially in those cases where drainage has been used. It is less likely to occur in the early operations where drainage can be dispensed with, but even then it cannot be wholly avoided. Some firm support ought always to be worn for years after the operation, and the thought that we are thus permanently weakening the abdominal wall, and imposing upon a man a great inconvenience if not positive danger, ought to make us exceedingly careful to avoid unnecessary interference.

Fæcal fistula is another occasional sequel of opera-

tion. I have had one fistula that persisted for seven months after the operation, but has finally closed spontaneously. It was in a case of late operation, where the appendix could not be removed, and the abscess was simply opened and drained. It is a great annoyance to the patient and to the physician, but will almost surely heal of itself, and rarely requires operative interference.

In conclusion, allow me to repeat that we can draw no hard and fast distinction between those cases which will require operation and those which will not. I feel in almost as much doubt as ever each time that the question is presented to me. There are one or two points, however, that increasing experience has impressed more and more strongly upon me, and they are the only definite conclusions which I can present. They are: (1) appendicitis is one of the most important as well as one of the most dangerous of all acute abdominal affections; (2) that some cases are fatal from the very nature of the initial attack; (3) that some have a natural tendency to recover; but (4) finally, that the great majority can be relieved only by surgical interference, and that early operations are in every way less difficult and less dangerous than late ones. In the majority of cases, the presumption is in favor of early operation, and unless distinctly counter-indicated the earlier the better. A surgeon seldom regrets an early operation, but is often disappointed by delay.

PRIMARY NASAL DIPHTHERIA.¹

BY CHARLES W. TOWNSEND, M.D.

THAT nasal diphtheria is a severe and often fatal disease, and that it is almost always secondary to diphtheria in the throat, is the generally-received idea both from practice and text-books.

Thus Dillon Brown, in Starr's "Text-Book of Children's Diseases," just published, says: "In the nares diphtheria is very serious, on account of the abundant lymph and blood-supply," etc.

W. Gilman Thompson, in Pepper's "American Text-Book of the Theory and Practice of Medicine," also just published, says: "Cases of nasal diphtheria are apt to end fatally unless vigorously treated."

And J. Lewis Smith says, in Keating's "Cyclopædia of Children's Diseases": "Nasal diphtheria involves great danger, from the fact that it is likely to give rise to systemic infection of a grave type." Lower down he says: "Although commonly diphtheritic inflammation of the nasal surfaces is secondary to that of the fauces, it is sometimes the primary inflammation. It may exist for some days before the fauces become affected, and under such circumstances the diagnosis is frequently not made until the disease is in an advanced stage and profound blood-poisoning has occurred."

That mild primary cases sometimes occur, the mildness of whose symptoms may permit them to go unrecognized, is a point I wish to emphasize, and particularly the fact that these cases are of great danger to the public health.

Dr. A. L. Mason² refers to these cases when he says: "Primary nasal diphtheria is probably more

common than is supposed, and a not infrequent source of unsuspected danger." Jacobi also alludes to them; and Major³ reports five cases very similar to those I am about to relate. The latter says of nasal diphtheria: "When of a *primary* nature, it is very likely to be overlooked altogether." It seems probable that some cases formerly supposed to be membranous rhinitis were in reality nasal diphtheria.

During the months of November, December and January of this winter fourteen cases of diphtheria occurred among the patients of the Children's Hospital, all but two of which came under my charge in the isolating wards.

The bacteriological examinations were made for the hospital by Dr. J. H. McCollom at the Harvard Medical School, and, it is unnecessary to say, were of the greatest value.

There were seven cases where the nose was affected; in six cases the disease was limited to the pharynx; and in one case an old tracheotomy wound was attacked, the disease spreading to the bronchi and rapidly proving fatal.

The six pharyngeal cases I will pass over briefly. They illustrate the well-known difficulty and oftentimes the impossibility of making a diagnosis of diphtheria from gross appearances or symptoms. They were all mild cases; all recovered. One of the earlier cases began with coryza, and had a nose-bleed on the day preceding the beginning of the throat affection; and although there is no positive proof of nasal diphtheria from the absence of cultures from the nose in this case, it is extremely probable, in view of the other cases, that this one was originally nasal diphtheria, and as such was overlooked.

Of the seven nasal cases of diphtheria, in five the disease was primarily nasal, being confined to the nares alone in four, in one extending later to the pharynx and larynx, while in the remaining two cases the disease was at first pharyngeal, and later involved the nose. These last two cases represent the secondary nasal forms more commonly seen, partly from the fact that the diagnosis of the trouble in the throat having been made, it is natural to suspect an extension to the nose in case there is a nasal discharge, and to look for membrane there, and partly because secondary nasal diphtheria is usually a very severe disease.

The primary nasal cases are easily overlooked; the diagnosis frequently cannot be made without a bacteriological examination, and they are particularly dangerous as sources of infection from these causes, and from the fact that the bacilli may be retained for a long time on the voluminous mucous membrane of the nose after the patient has apparently recovered, and may even at times elude the search of the bacteriologist, as some of my cases show.

CASE I. A boy, four years old, began to have a nasal discharge on January 3d. This increased on the following day, but there was no rise of temperature, and the pulse showed no weakness. The nasal discharge was watery and at times muco-purulent, and was not offensive. On the third day of the coryza careful examination showed some gray membrane in each nostril, and a bacteriological examination demonstrated the Klebs-Löffler bacillus. There were nose-bleeds from time to time. The temperature, as will be seen by the chart, remained between 99° and 100°

³ Diphtheria and Scarlet Fever at the Boston City Hospital. Bulletin 4, Harvard Medical School Association.

¹ Read before the Boston Society for Medical Improvement, March 12, 1894.

² Burnett: System of Diseases of the Ear, Nose and Throat, vol. i, p. 270.