

be forced to keep our patient quiet for several days, using ice-bags and massage, before we can put on the bandage or Gibney's plaster bandages, and put the patient on his feet. It is astonishing to the surgeon how quickly the patient can get over the sprain, if compression be put on the joint and the patient receives massage and gets about. I know a recent case where the plaster dressings and rest were used in a sprain of the ankle and foot, where two years and six months were required to put the patient on his feet without crutches and appliances at his ankle, and I feel sure that had this patient been treated properly along the lines mentioned in this paper, only a few months would have been required at the utmost. As it was he was in almost useless condition at the end of two years and three months. The muscles of his leg were atrophied, there was too much motion at the ankle-joint, and the patient was fearful of putting his weight on his leg, and complained of getting tired quickly, and of pain in the whole limb. Systematic massage, use and encouragement sufficed in a short time to remove all this disability. In these old cases, besides the measures referred to, the use of the Scottish douche is good, that is, hot and cold water applied alternately. It is of great value in promoting recovery. Swedish gymnastics, in the shape of active and passive movements of all the joints of the limb affected should be used, in conjunction with other measures. In the vast majority of sprains of the ankle, the ambulatory treatment is very satisfactory. The average time required for recovery will be from six to twelve days. In 400 cases it was nine days. (Douglas Graham.)

A muscular strain of considerable severity will show to the palpating finger an elevation of ruptured muscular fibers. In these cases a little gentle massage will promote speedy recovery. In a vast majority of so-called muscular strains, there will be no elevation to be felt by the palpating finger, and in these cases the cold douche, and static electricity both for its local and mental effect, gives remarkable recoveries.

To recapitulate: 1. Ligaments are rarely if ever torn in so-called sprains, and are never stretched. 2. The pathology in the majority of sprains is a rupture of the areolar and connective tissue around the joint, and a contusion of the lining of the joints. 3. Immobilization of muscles is not rest. On the contrary, in all sprains the muscles should have passive exercise the first few hours, and days, and active exercise after that. In the majority of cases active exercise should be instituted from the beginning. 4. The plaster casts should not be used at all, even in cases where we have a fracture, unless it be impossible to maintain a proper position of the joint. 5. Hydrotherapy in the shape of ice applied over a wet cloth the first few hours; water in the shape of hot fomentations or in the shape of the Scottish douche, where we wish a stimulation, is of very great value. 6. The counter-irritation of static electricity in conjunction with massage is the best treatment for a strain. 7. The ambulatory treatment of sprains in conjunction with massage is to-day the best treatment.

**Statistics of Quebec Province.**—There has been evidently a marked falling off in the ratio of increase of the population in the province of Quebec during the last decade. In the report of the board of health for the year 1900, the recorder of statistics estimates the increase in population between 1898 and 1899 only 2.5 per cent. The large centers of population have gained most, but the aggregate for the whole territory being slight it would appear that in the rural districts here as elsewhere there has been possibly some local actual decrease.

## DIAGNOSIS AND SYMPTOMATOLOGY IN THE APPENDICITIS OF CHILDREN.\*

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So much has been published in medical literature of late on the subject of appendical inflammation, that it might seem but little remained pertaining to it to be further elucidated.

The operative technique in its surgical management has nearly advanced to perfection, so that in properly selected cases, and utilized at the proper time, surgical intervention in skilled hands should be followed by only a very low mortality. The greatest difficulty which confronts the surgeon is not so much how the operation shall be done, as the question of properly interpreting symptoms, locating the precise seat of pathologic changes and appreciating the character of existing complications.

### THE GENERAL AND SPECIAL CHARACTERS OF APPENDICITIS IN EARLY LIFE.

In 1827 Melier first accurately described the pathology of appendicitis and recommended the excision of the appendix (*Mémoire et observations sur quelques maladies de l'appendice caecal*).<sup>1</sup> There was no echo to his publication until 1838, when the writings of Albus, Dance and Menière appeared. Although these authors approved of radical measures they maintained that the primary seat of lesion was in the cecum, as is maintained to-day by Treves. About 1888 the original observations of Sands, Fitz, and Talamon appeared, with the brilliant achievements of McBurney which settled beyond dispute the fact that in the great majority of cases the original lesion is in the appendix and that this organ must be primarily dealt with. On Friday, Dec. 30, 1887, the late Prof. Henry B. Sands, of New York, performed the first operation for appendicitis successfully after having first correctly diagnosed the condition existing. The patient was a male, 12 years old. The case had first been diagnosed as one of perityphlitis. He tells us that the child had indigestion, etc., and that there was no tumor.<sup>2</sup>

Weir, in 1887, was able to collect but 15 cases in which laparotomy had been performed for perforated intestine; the appendix was the seat of perforation or gangrene in 4 of these, although it was not discovered until after death. In 5 the appendix was found perforated, and removed, but all died.<sup>3</sup>

Appendicitis presents practically the same sexual difference in early life as is noted later in the adult; thus Jalaguier records 182 cases in his own practice, 4 were under 5 years; 42 from 5 to 6; 64 from 10 to 15; 25 from 15 to 20. There were 112 males and 70 females.<sup>4</sup> According to Bamberger's table, the relative frequency as to age was: Under 2 years, 2 cases; 15 to 20 years, 20 cases; 20 to 30 years, 32 cases; after 30 years, 17 cases. Fitz's table shows: 20 months to 10 years, 22 cases; 10 years to 20 years, 86 cases; 20 to 30 years, 65 cases; after 30 years 55 cases. Matterstock's table shows: Under 2 years, 2 cases; 2 to 5 years, 10 cases; 5 to 10 years, 25 cases; 10 to 15 years, 35 cases. Gordon's table reads: 2 to 5 years, 5 cases; 5 to 10 years, 33, and 10 to 15 years, 41 cases. Bruns' table says: 1 to 5

\* Read by title, in the Section on Diseases of Children, at the Fifty-first Annual Meeting of the American Medical Association, held at Atlantic City, N. J., June 5-8, 1900.

years, 3 cases; 5 to 10 years, 20, and 10 to 15 years, 12 cases.<sup>5</sup>

It is curious to note that Dieulafoy, Bruns, and Faisans include heredity as a *cause appendicite familiale*.

In New York City, in 1899, there were 299 deaths from appendicitis, of which 63, or more than one-fifth, were in those under 15 years old, viz.: 1 year, 1 case; 3 years, 2; 4 years, 4; 5 years, 14; 10 years, 20, and 15 years, 22 cases. With a population of about 2,000,000, and assuming that 25 per cent. of it is under 15 years of age, the annual mortality would be 1 for every 7933.

Medical literature records but few cases of appendicitis in very young children and infants, except those which have been operated on. We have no data to show whether this disease ever occurs in the infant subsisting exclusively on the mother's milk, and there are but few cases recorded as occurring before dentition has begun or the infant has begun to masticate food. However, there are cases recorded of very early operation for appendicitis with varying results. The youngest patient operated on for appendicitis, on record, was one treated by Dr. Thomas A. Savage of New York, only 61 days old. A large perforation of the tip of the appendix was found. The infant sank the day following the operation.<sup>6</sup> Weiss operated for the same lesion on an infant 20 months old, with general peritonitis and death.<sup>7</sup> Mr. Miller saw a case of appendicitis in an infant 19 months old. The infant was at first costive and it was believed that he was suffering from follicular enteritis. On the fifth day of illness Professor Broca was called in, and laparotomy performed, evacuating a large abscess and exposing a rotten appendix. Good recovery followed.<sup>8</sup> In reviewing my own notes on appendical cases seen in hospitals, in consultation and in my own practice, I find 67 cases under 15 years old: 16 were operated on with 4 deaths; 5 were attended with advanced general peritonitis and died without operation. Forty-two others were seen; 6 very severe cases in which operation was refused, of which 2 died. Forty-six were of various types in which it was not believed that laparotomy was imperative; of these all recovered except two in tubercular patients under 9 years. There were 41 males and 26 females, the youngest 3 years old, the abscess bursting through the umbilicus. The ages were: 3 to 4 years, 1 case; 4 to 5 years, 4; 5 to 10 years, 27; 10 to 15 years, 35 cases.

With this experience of appendicitis in the young it is my conviction that although the causative factors remain obscure at this stage, as later, and the treatment should continue on the same general lines, there remains a wide difference in the diagnostic factors of the disease in childhood, and that its symptomatology, when anatomical deviations are absent, is more complex and more indefinite than in later life. Goodrich believes that children bear general septic peritonitis much better than adults. He has had several cases of general septic peritonitis in children, and has not lost one of them; as an instance he cites the case of a boy who entered the Long Island Hospital with gangrenous appendicitis, the peritoneal cavity being distended with a sero-purulent fluid. The appendix was removed, the peritoneal cavity washed with saline solution and "sewed up without a drain," rapid recovery following.<sup>9</sup>

My own experience fully confirms this view. Among the cases included in my own tables there were 2 of general peritonitis recovering. One was in a girl of 7 years, in a desperate condition; the distal half of the appendix had sloughed off, the distended parietic bowel

protruded through the cut, and sero-purulent fluid flowed out from every direction. Shock was so great that no time was lost in systematic cleansing of the peritoneum. Recovery, though slow, was finally complete. The other patient was a boy of 5 years, with acute general peritonitis following appendicitis. The parents refused to permit an operation and, though a fatal prognosis was given, the little fellow made a good recovery. I am unable to find any statistics bearing on the relative mortality of laparotomy in the child and adult, although for many important reasons it should be lower in the former than the latter. Local complications should be fewer in early years; organic disease, senile changes or those constitutional or functional disturbances so common in middle or advanced age are not so frequent; moreover, it is well known that children bear the effects of pulmonary anesthetics with greater impunity than adults.

#### DIAGNOSIS.

The recognition of appendicitis should be easier during the early growth of the body than later.

*Anatomical Features.*—During the early childhood the pelvis is of narrower dimensions; evolution of the intestinal tract is incomplete, the large intestine is relatively smaller and all its segments are more mobile than after puberty. The position of the cecum is more indefinite, as at this time its attachment to the iliac fascia is lax, and this permits of a considerable range of motion in various directions. Jacobi has demonstrated how this species of enteroptosis acts as an aggravating factor in the constipation of infancy. The abdomen in childhood is rarely invested by a deep layer of fat, and hence the caput coli, when it has descended, lies superficially. As growth advances and the body develops, defecation becomes less frequent and the strain on the colon, in consequence of its capacity, becomes greater, and its position more fixed and definite.

*Complications and Pathologic Conditions which May Obscure Diagnosis.*—As contrasted with the adult, the pathologic conditions which may be confounded with appendicitis or mistaken for it in the child are few in number. The two most prominent are intussusception and tubercular peritonitis. It is curious to note, however, that even in childhood we can not fail to appreciate the importance of a critical abdominal examination and a search for other conditions which may in many respects, in the child as in the adult, simulate appendicitis. For example, at the British Medical Association's meeting held in July, 1898, Dr. J. Cromby reported 18 cases of floating kidney in children. The youngest child was 3 months old, the eldest 15 years; 16 were in females. Tuffier records 3 similar cases in children of 6, 9, and 10 years old.<sup>10</sup> What Dr. M. L. Harris, of Chicago, says of "Diagnosis of Abdominal Tumors," particularly applies to children in whom complex pathologic states are not yet in evidence. He observes: "Our knowledge must not be limited simply to normal anatomy, but we must know abnormal anatomy, or the anomalies to which the various organs are liable. For instance, the liver may occupy the left side of the abdomen instead of the right, and the location of all other organs may be reversed as well. The gall bladder instead of being retained against the inferior surface of the liver may be quite loosely attached to it, and thus possess quite a range of motion. The liver may possess 'accessory' or 'Schnur' lobes, which may appear as distinct tumors. There may be but one kidney instead of two, or the two may form a conglomerate organ

occupying the median position, or a kidney may occupy any location from the normal to the hollow of the sacrum, and may be fixed or freely movable. The intestinal tract is subject to numerous anomalies. The cecum and appendix may be found near the umbilicus or up under the liver, or they may be arrested at any point in their descent from the liver to their normal location in the iliac fossa. The appendix may dip into the pelvis lying against the uterus or the ovary and tube, or it may be extra-peritoneal, its tip reaching up to the kidney. The ovaries instead of occupying the lesser pelvis, may be retained in the lumbar region or descend into the labia. The uterus may be double instead of single and each half may vary in its degree of development. These are but a few of the anomalies which one must ever bear in mind when considering the diagnosis of abdominal tumor, and often an anomaly of location or development will lead to a correct solution of a case which would otherwise remain unsolved."<sup>11</sup>

Halle and Bernard<sup>12</sup> record a case of peri-nephritic abscess in an infant 18 months old. The mass was in the right side and was at first believed to be a case of encysted peritonitis with atypical appendix. Through the mistake in diagnosis, the author tells us, they made the incision for evacuation too far forward, and soiled the peritoneal cavity by the escape of pus into it. Menard cites the case of a girl 10 years old, who was suddenly seized with lameness in the right lower limb, from what was regarded as coxalgia in the beginning. As the case presented complex features and the limb was exquisitely sensitive, an anesthetic was given, before a critical examination was made. Then a mass was discovered deeply lodged in the right groin. A free incision was made into it, a large abscess opened and a necrotic appendix exposed. Recovery was rapid, with complete disappearance of all lameness.

Tubercular disease of the lumbar vertebræ is not uncommon in children, but the psoas abscess resulting in them usually follows the muscular sheath out under the crural arcade; however, Cathelin reports a case in which a psoas abscess was lodged in the right iliac fossa complicated with tubercular perforation of the appendix.<sup>14</sup>

Umbilical abscesses in young children are most frequently of appendical origin. One such case is recorded in my own group. At first the thin scar tissue of the umbilicus pointed and broke, giving issue to a copious purulent discharge; the day after, fluid fecal matter appeared in the opening. From the history of the case, the symptoms and the fulness which commenced at the border of the lowest rib and extended over centrally, it was thought that the appendix was the primary source of the trouble and that from its perforation a fecal fistula had begun. By a free incision the cecum was exposed, lodged high up and well forward. After cautious manipulation the root of it was secured, doubly closed with silk ligature and cut through. As the tissues were freely suppurating, a gauze drain was introduced. Recovery was tedious, but from the day laparotomy was done, discharge at the umbilicus ceased.

Wyeth records a somewhat similar case in a young man of 30. He died suddenly, of apoplexy. On autopsy the perforated, rotten appendix was found lying free in the abscess cavity.

Guiteras cites a case of abscess in a cystic terminus of the ureters, which have been diagnosed appendicitis. Mr. G. W. Wright published notes of a case of chronic

intussusception of the appendix in a child 2 years old. The tumor could be felt on a line with, and to the left of, the umbilicus. On incision, the root of the appendix was found invaginated into the cecum.<sup>16</sup>

Genito-urinary disturbances may lead to mistakes in diagnosis when a large, deep, tense appendical abscess greatly stretches or compresses the ureter, or when it bursts into the bladder and leaves a fistulous opening, connecting one with the other. Most perityphlitic abscesses drain directly into the colon, where the pus is carried off by the emunctories, but the course is sometimes by the vesical route, as occurred in a young sailor operated on by me two years after he first had appendicitis in the West Indies.

Typhlitis, with or without perforation, a condition said to be not very uncommon in tubercular peritonitis, presents practically the same physical signs as appendicitis, although some authorities allege that in tuberculous perforations rarely occur except in the latter.

#### THE MORE COMMON MALADIES WHICH PRESENT SEVERAL FEATURES SIMILAR TO APPENDICITIS.

*Tubercular Peritonitis.*—Tubercular peritonitis may be general or localized; when limited to the mesentery or parietal peritoneum, and when there is attendant paresis of the intestines or ascites it is quite impossible to affirm whether or not the appendix is involved. Under these circumstances I have often seen an operation undertaken for appendicitis reveal no lesion of the organ. The acute, fulminant type of peritoneal tuberculosis is said, in the majority of cases, to have its primary seat in the peri-appendical lymph tissues contiguous with the cecum.

*Intussusception.*—This condition is one which quite invariably belongs to early infancy. Wiggin, Kelsey and Carpenter have recorded successful laparotomy for it in infants from 2 to 3 months old. It is said to sometimes present several characters common to appendicitis: when of the subacute variety. The point of invagination is usually the cecum, the abdomen is distended and there is a tumor. But the age of the infant, the evidence of strangulation and the bloody stools, together with the extreme rarity of the lesion, should seldom leave much doubt as to its real character. Fenger and Gerhards<sup>17</sup> record a case of appendicitis in an infant 7 weeks old, and Matterstock had seen it in one of 6 months, both presenting features in common with intussusception. Gordon speaks of intussusception being more common in "1st infancy" before dentition, and says that appendicitis steadily increases in frequency from the 2d to the 15th year.

*Typhoid Fever.*—Typhoid in children is well known to pursue an atypical course, and occasionally may be mistaken for appendicitis. Warren tells us that in those mixed cases presenting complex clinical features, we can not rely on Vidal's test. Diarrhea is not an uncommon concomitant of appendicitis, and in both, iliac tumefaction and tenderness are generally present.

*Appendicitis with Appendical Invagination into the Cecum.*—This remarkable condition has been described by various writers. Harrison cites a case of intussusception of the appendix with invagination in a child 4 years old.<sup>18</sup> John Kidd, another in a child of 7 years, the greatest pain being over the umbilicus. Dr. S. McGraw reported a case in a lad of 7, the condition lasting four months. The head of the cecum and appendix were removed; recovery following.<sup>19</sup> Other instances of this singular complication are recorded in Mr. Greig Smith's work.<sup>20</sup> Intussusception of the appendix, with or with-

out ulceration or perforation, though anatomically of great interest, evidently presents no special definite points for diagnosis, and if it did, its treatment would be on the same general lines called when laparotomy is performed for appendicitis. All the cases on record occurred in young children.

#### EXAMINATION OF THE BLOOD AS AN AID TO DIAGNOSIS OF APPENDICITIS.

So far we have been able to derive but little if any assistance in the differential diagnosis of local or general disease, by examination of the blood microscopically, except, perhaps, in paludal affections. The presence of the leucocytosis, however, has been supposed by some to establish the evidence of pus formation in febrile conditions of the system. But corpuscular count in my own hands has proved so indefinite and delusive as to have convinced me that it possesses no practical value whatsoever in suppurative lesions. Not long since a noted member of the profession, in an obscure abdominal lesion, in a patient of mine, diagnosed a neoplasm of the spleen from the pronounced state of leucocytosis found on microscopic examination of the blood; but on abdominal section the greater part of the stomach was found destroyed by carcinoma, the spleen being entirely healthy. Warren says that count in the average case of pus-tube or appendicitis shows from 15,000 to 30,000 white discs per cubic millimeter; he adds that it is not the product but the virulence of the infection which governs the count. "The degree of leucocytosis is independent of the amount of pus, a felon may raise the count as much as an empyema."<sup>21</sup>

#### PHYSICAL EXAMINATION OF THE PATIENT.

The most reliable and definite source of information in the diagnosis of appendicitis is through exposure and critical examination of the abdominal walls. This may be generally efficiently performed in the conscious state. It may, however, possess indefinite value and lead to fallacious conclusions, if we fail to secure a full clinical history of the case, and if we have not thoroughly analyzed all the symptoms before we proceed. It goes without saying, that, in consequence of the thin abdominal walls and the absence of those organic maladies so often encountered in adults, especially females, this examination should be a comparatively simple matter in the appendicitis of a child in all its stages; and so it certainly is, though admitting this; yet when we bear in mind the immature stages of development and the different relations of the viscera we can understand how we may even here be led into error.

#### SURFACE EXAMINATION.

*Inspection.*—It is well, in all examinations of the abdomen, to place the patient on a flat surface on the back, when this is expedient. If the child is restless or intractable other means may be necessary. The first thing we will notice in appendicitis is the flexion of the right lower limb, although Gibney, the noted orthopedic surgeon, warns us not to attach too much importance to this alone, as we have it also in coxitis and psoas abscess. We will have the same phenomenon in an over-distended bladder, when both limbs are drawn up.

#### TYMPANITES AND INCREASED RESPIRATION.

Abdominal distension in varying degrees is a common accompaniment of appendicitis in all its stages, but it may depend on other causes than intestinal paresis.

The physiologic character of the respiration is practically the same in both sexes in childhood. In peritonitis the respirations are frequent and shallow; we will note that the movements of the diaphragm are restricted and that respiration is mostly thoracic.

*Manipulation, Palpation, and Percussion.*—Digital exploration of the abdomen is a most valuable resource. Muscular resistance or rigidity is present in varying degree, according to the location and extent of inflammatory changes. In most cases distinct localized tumefaction is made out over the site of the diseased appendix. Deaver notes that in some cases of hyperesthesia-abdominalis a tumor may be present, but it can not be delineated by palpation. The full flexion of the thigh on the abdomen always materially aids in localizing the tumor by relaxing the abdominal muscles. Dr. Edebohls attaches great importance to the value of palpating in localizing the appendix in inflammatory conditions. After a trial of this device, on the abdomen of several fresh cadavers, and those of patients about to be operated on, no single instance has ever come under my observation wherein definite location of the appendix was possible. A general safe working guide for the approximate location of the appendix is where the lodgment of the tumor is best defined. When the cecum is normally located this is at what is known as "McBurney's point."

*Percussion.*—This is an important adjunct, but when the abdomen is meteoric and hypersensitive it may be impracticable without the employment of an anesthetic. In cases of suspected fecal impaction or vesical overdistension, it is of the greatest importance.

*Deep Puncture.*—Deep puncture by the hypodermic or aspirating needle has been employed as an aid in the diagnosis of perityphlitic abscess, but it is not without danger and is not always reliable. Haupt records the employment of puncture in 116 children's cases. Pus was found but once, though on operation an abundance of purulent formation was exposed, in most all the cases. Ten years ago a boy of 12 years came under my care for the treatment of appendical abscess. In order to convince the parent that pus was present, I passed in, behind and below the cecum, a long exploratory needle. This was at once filled with purulent material. But the parents were obdurate and would not consent to an operation, and the boy made a good recovery without it. About the same time, the late Dr. John G. Truax, in the Harlem Hospital service, finding a very large inflammatory fulness in the right iliac fossa, with signs of appendicitis, passed in an aspirator needle, drew off a pint of fetid pus, injected the cavity with saline solution and then drew this off, the patient making an excellent recovery.

*Rectal Evacuation.*—This may be utilized with advantage in many cases of appendicitis in early life. By this route the examination is availed of for the special purposes: 1. In order to determine the presence or absence of co-prostatitis, fecal impaction of the colon or rectum. 2. In order to locate the site of the appendix or tumor and the extent of purulent accumulation.

By conjoined manipulations under an anesthetic, nearly any localized fulness below the umbilicus, in a child under 10 years, usually may be detected and its general characters appreciated.

#### SYMPTOMATOLOGY.

At the threshold of this phase of our study the questions arise: "Is there a wide distinction in the general characters of the symptoms of appendicitis in the child

DEATHS FROM APPENDICITIS, BOROUGH OF MANHATTAN AND THE BRONX, DURING DECADE 1890-1899, ARRANGED BY QUARTERS.\*  
Year 1890.

		Total.	1 year.	1 year.	2 years.	3 years.	4 years.	Total under 5 years.	5-10	10-15	15-20	20-25	25-35	35-45	45-55	55-65	65-75	75-85	85+	Colored.
First Quarter...	Males...	12	1	1	1	1	1	1	1	1	2	1	2	2	3	1	1	1	1	1
	Females	9	1	1	1	1	1	1	1	1	1	1	4	1	1	1	1	1	1	1
Second Quarter...	Males...	18	1	1	1	1	1	1	3	2	1	1	4	1	3	3	1	1	1	1
	Females	10	1	1	1	1	1	1	1	1	1	1	4	1	2	1	1	1	1	1
Third Quarter...	Males...	17	1	1	1	1	1	1	1	3	4	2	3	1	1	1	1	1	1	1
	Females	4	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Fourth Quarter...	Males...	13	1	1	1	1	1	1	2	1	2	1	3	2	2	2	1	1	1	1
	Females	4	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Total .....	Males...	60	1	1	1	1	1	1	7	7	9	4	12	6	9	4	1	1	1	1
Total .....	Females	27	1	1	1	1	1	1	1	1	4	3	9	2	5	1	1	1	1	1

Appendicitis, 87; Suicides, 239.

## Year 1891.

First Quarter...	Males...	9	1	1	1	1	1	1	1	2	2	1	2	1	1	1	1	1	1	1
	Females	5	1	1	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1	1
Second Quarter...	Males...	9	1	1	1	1	1	1	1	1	1	1	2	2	1	1	1	1	1	1
	Females	7	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Third Quarter...	Males...	24	1	1	1	1	1	1	2	4	4	3	4	4	2	1	1	1	1	1
	Females	9	1	1	1	1	1	1	2	2	1	1	1	1	1	1	1	1	1	1
Fourth Quarter...	Males...	10	1	1	1	1	1	1	1	1	1	3	2	1	2	1	1	1	1	1
	Females	10	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Total .....	Males...	52	1	1	1	1	1	1	3	8	6	7	10	8	6	3	3	3	3	1
Total .....	Females	31	1	1	1	1	1	1	5	3	2	3	2	6	4	3	2	2	2	1

Appendicitis, 83; Suicides, 300.

## Year 1892.

First Quarter...	Males...	18	1	1	1	1	1	1	3	1	1	3	2	3	2	3	1	1	1	1
	Females	12	1	1	1	1	1	1	1	2	1	4	3	1	1	1	1	1	1	1
Second Quarter...	Males...	17	1	1	1	1	1	1	1	2	2	4	4	1	1	1	1	1	1	1
	Females	17	1	1	1	1	1	1	1	1	3	1	6	2	1	1	1	1	1	1
Third Quarter...	Males...	27	1	1	1	1	1	1	2	5	1	6	5	1	4	1	2	1	1	1
	Females	11	1	1	1	1	1	1	1	1	1	2	1	1	1	2	1	1	1	1
Fourth Quarter...	Males...	16	1	1	1	1	1	1	1	3	2	4	3	2	1	1	1	1	1	1
	Females	11	1	1	1	1	1	1	1	2	2	2	1	1	1	1	2	1	1	1
Total .....	Males...	78	1	1	1	1	1	1	6	10	6	17	14	7	7	5	4	4	4	1
Total .....	Females	51	1	1	1	1	1	1	3	6	7	9	10	3	3	4	3	2	2	1

Appendicitis, 129; Suicides, 249.

## Year 1893.

First Quarter...	Males...	8	1	1	1	1	1	1	1	1	1	3	4	1	1	1	1	1	1	1
	Females	5	1	1	1	1	1	1	1	1	2	2	1	1	1	1	1	1	1	1
Second Quarter...	Males...	13	1	1	1	1	1	1	2	2	2	3	1	2	1	2	1	1	1	1
	Females	13	1	1	1	1	1	1	1	1	2	2	2	1	1	2	1	1	1	1
Third Quarter...	Males...	20	1	1	1	1	1	1	1	1	3	4	9	1	2	1	1	1	1	1
	Females	9	1	1	1	1	1	1	1	1	1	2	1	1	1	1	2	1	1	1
Fourth Quarter...	Males...	15	1	1	1	1	1	1	3	3	1	1	4	1	2	1	1	1	1	1
	Females	4	1	1	1	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1
Total .....	Males...	56	1	1	1	1	1	1	4	6	7	8	17	8	4	2	2	2	2	1
Total .....	Females	31	1	1	1	1	1	1	4	2	3	6	3	6	1	3	2	2	2	1

Appendicitis, 87; Suicides, 314.

## Year 1894.

First Quarter...	Males...	14	1	1	1	1	1	1	3	2	1	3	2	3	3	1	1	1	1	1
	Females	12	1	1	1	1	1	1	1	1	2	2	3	2	2	1	1	1	1	1
Second Quarter...	Males...	24	1	1	1	1	1	1	1	3	2	5	5	3	4	1	1	1	1	1
	Females	6	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Third Quarter...	Males...	18	1	1	1	1	1	1	1	2	4	4	1	2	3	2	1	1	1	1
	Females	13	1	1	1	1	1	1	1	2	1	1	2	2	3	2	1	1	1	1
Fourth Quarter...	Males...	13	1	1	1	1	1	1	2	2	2	1	5	1	3	1	1	1	1	1
	Females	17	1	1	1	1	1	1	3	3	2	2	4	1	4	2	1	1	1	1
Total .....	Males...	69	1	1	1	1	1	1	5	9	8	11	13	7	13	7	3	3	3	1
Total .....	Females	48	1	1	1	1	1	1	6	8	3	6	7	9	5	3	2	2	2	2

Appendicitis, 117; Suicide, 331.

## Year 1895.

First Quarter...	Males...	26	1	1	1	1	1	1	4	3	6	3	3	2	1	5	1	1	1	1
	Females	26	1	1	1	1	1	1	2	3	4	4	3	5	1	4	1	1	1	1
Second Quarter...	Males...	24	1	1	1	1	1	1	1	2	2	5	8	5	1	1	1	1	1	1
	Females	15	1	1	1	1	1	1	4	1	1	4	4	1	1	1	1	1	1	1
Third Quarter...	Males...	40	2	1	1	2	5	8	4	4	4	4	4	5	5	1	2	1	1	1
	Females	25	1	1	1	1	1	1	2	2	2	3	8	5	1	2	1	1	1	1
Fourth Quarter...	Males...	23	1	1	1	1	1	3	5	5	2	5	4	1	3	1	1	1	1	1
	Females	13	1	1	1	1	1	1	6	1	2	2	1	3	1	1	1	1	1	1
Total .....	Males...	113	2	1	2	1	2	8	16	11	12	17	19	12	9	6	3	3	3	1
Total .....	Females	79	1	1	1	1	1	1	8	11	6	13	16	14	3	6	1	1	1	1

Appendicitis, 182; Suicides, 376.

## Year 1896.

First Quarter...	Males...	29	1	1	1	1	1	4	4	1	4	3	4	6	4	2	1	1	1	1
	Females	15	1	1	1	1	1	4	1	1	1	1	2	1	3	1	1	1	1	1
Second Quarter...	Males...	31	1	1	1	1	2	3	4	4	2	6	5	3	1	3	2	1	1	1
	Females	21	1	1	1	1	1	2	4	3	1	6	1	1	1	3	1	1	1	1
Third Quarter...	Males...	38	1	1	1	1	1	5	6	4	4	5	4	8	4	1	1	1	1	1
	Females	24	1	1	1	1	1	3	1	2	2	5	5	5	1	1	1	1	1	1
Fourth Quarter...	Males...	31	1	1	1	1	1	2	2	5	7	9	4	3	1	1	1	1	1	1
	Females	12	1	1	1	1	1	2	1	1	2	2	2	1	1	1	1	1	1	1
Total .....	Males...	129	1	3	1	3	3	12	12	15	21	22	21	12	7	4	1	1	1	2
Total .....	Females	72	1	1	1	1	1	11	7	7	9	15	8	5	5	3	1	1	1	1

Appendicitis, 201; Suicides, 384.

## Year 1897.

First Quarter...	Males...	38	1	1	1	1	1	4	5	4	4	11	4	4	4	1	1	1	1	3
	Females	15	1	1	1	1	1	4	1	1	1	3	4	4	1	2	1	1	1	2
Second Quarter...	Males...	25	1	1	1	1	1	5	4	3	3	4	4	4	2	1	1	1	1	1
	Females	20	1	1	1	1	1	3	3	1	3	3	4	1	1	3	2	1	1	1
Third Quarter...	Males...	35	1	1	1	1	1	4	8	5	9	2	2	2	3	2	2	1	1	1
	Females	18	1	1	1	1	1	1	5	2	2	2	4	1	3	1	1	1	1	1
Fourth Quarter...	Males...	27	1	1	1	1	1	2	6	1	3	3	3	8	1	1	1	1	1	3
	Females	15	1	1	1	1	1	1	3	1	2	2	3	3	2	1	1	1	1	1
Total .....	Males...	125	1	1	1	1	3	15	23	13	18	20	18	10	4	1	1	1	1	7
Total .....	Females	68	1	1	1	1	1	9	11	4	7	13	8	7	7	2	2	2	2	2

Appendicitis, 193; Suicides, 436.

\* The Bronx is a district on the North recently annexed to New York.

		Year 1898.															
First Quarter...	Males...	40	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	Females...	24	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Second Quarter...	Males...	28	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	Females...	33	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Third Quarter...	Males...	42	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	Females...	27	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Fourth Quarter...	Males...	40	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	Females...	18	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Total .....	Males...	150	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Total .....	Females...	102	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

Appendicitis, 252; Suicides, 428.

		Year 1899.															
First Quarter...	Males...	35	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	Females...	29	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Second Quarter...	Males...	59	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	Females...	42	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Third Quarter...	Males...	51	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	Females...	28	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Fourth Quarter...	Males...	35	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	Females...	27	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Total .....	Males...	180	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Total .....	Females...	126	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

Appendicitis, 306; Suicides, 400.

## DEATHS FROM APPENDICITIS, NEW YORK CITY, YEAR 1899, ARRANGED BY QUARTERS.\*

		Year 1899.															
First Quarter...	Males...	54	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	Females...	39	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Second Quarter...	Males...	78	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	Females...	59	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Third Quarter...	Males...	80	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	Females...	43	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Fourth Quarter...	Males...	53	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	Females...	36	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Total .....	Males...	265	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Total .....	Females...	177	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Total of both sexes...		442	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

\* Manhattan and Bronx Boroughs.

Estimated population Greater New York, July 1, 1899, 3,550,053.  
 Estimated mean population of New York (present boroughs of Manhattan and Bronx), for ten years, 1890-1899, inclusive:

1890.....	1,612,559	1895.....	1,879,195
1891.....	1,659,654	1896.....	1,934,077
1892.....	1,708,124	1897.....	1,990,562
1893.....	1,750,010	1898.....	2,048,830
1894.....	1,809,353	1899.....	2,117,106

Estimated mean population of Manhattan and The Bronx since consolidation:

	1898.	1899.
Manhattan .....	1,911,755	1,953,569
The Bronx .....	137,075	163,537
	2,048,830	2,117,106

and the adult?" Is the disease so much more common in early life that we should be on the alert for it when painful abdominal symptoms suddenly set in? Has appendicitis a large mortality in childhood? We certainly have reason to believe that various innocuous types of typhlitis and appendicitis are very common in early life, but though there is at this stage an absence of many complex pathologic conditions found only in the adult, which give rise to symptoms similar to cecal implication, here even in childhood and infancy there are numerous diseased states that in their general features and most pronounced symptoms are quite identical with appendicitis.

## STATISTICS.

In order to determine the relative mortality of appendicitis at the different stages of life, I requested Dr. R. S. Tracy, the registrar of records in the Health Department of New York, to provide me with data under this head. Below are the figures very kindly supplied by him. These tables include all the cases of appendicitis ending fatally in New York City, and the annexed district north, in the ten years preceding 1900. There were in all 1637 deaths; in children under 5 years, 218 cases; 1331 in children under 15 years; 375 cases; 22.90. Just before these appended tables were prepared for me, the question of prophylactic appendectomy was discussed in the *St. Louis Medical Review*, when I was able to show that the annual number of deaths from suicide in New York was greater than from appendicitis.

## CONSTITUTIONAL AND LOCAL SYMPTOMS.

Richardson has said that "the presence of acute ap-

pendicitis is rightly regarded as easy to determine, as there are few diseases which have so uniform a set of symptoms." This statement is no doubt correct, in typical cases, but if it be intended to apply to many of the complex forms seen in childhood, it will not hold.

The dominant symptoms, fever and colicky pains, are very common in many maladies of infancy and childhood. Holt has called attention to the frequent presence of severe epigastric pain from hepatic or splenic congestion in malaria of early life. All know how common painful disturbances are along the intestinal tract, from worms—*ascarides* and *lumbricoides*—in children. Recently, Frazer reported a case of appendicitis in which the appendix was found filled with oxyurides vermiculares. The patient was 2 years old.<sup>22</sup>

Tuberculosis of the intestinal tract, its serous investment or its lymphatic glands in the inflammatory stages, is attended with pain varying in intensity and location. Its usual site is the hypogastrium, although sometimes the area of hyperesthesia will be found over the site of pathologic changes in the tissues. Dysenteric and diarrheal diseases in childhood and infancy are quite invariably attended by spells of severe pain. These conditions may precede or accompany appendicitis of a severe form in young children. Griffith in recording two successful operations for appendicitis in two patients, 3 and 4 years old, respectively, says that in both there was a marked distension of the abdomen with a dysenteric diarrhea.<sup>23</sup> The constitutional symptoms of acute appendicitis are quite identical with those of peritonitis, in fact, in nearly every well-marked case of appendicitis the peritoneum is involved. Pain, fever, thirst, vomiting, a quick pulse with great prostration, warn us that some serious pathologic condition is in operation, involving parts invested by the peritoneum. The parietic intestine and bladder contribute toward abdominal distension. The spread of infection up through the parietal investment extends into the muscles and all the overlying tissue. Muscular rigidity and free edema along the lateral plane of the abdomen, in peritonitis, is one of the consequences.

Despine says that the inception of the septic form is more insidious in the child, and so the disease is



more redoubtable. This author also alleges that perforation is here more common than with the adult. Acute severe appendicitis often begins with the symptoms of mechanical obstruction of the intestine, although in some cases of interstitial tuberculosis the same phenomenon may obtain. Quènu records such a case, in which the first symptoms pointed to occlusion and the second to appendicitis.<sup>24</sup>

That the premonitory symptoms of appendicitis in the child are more subtle and insidious than in the adult is lacking in support. Richardson, speaking of the symptoms in general, says that "pathological processes, ulcerative, etc., may go on without symptoms until the peritoneal coat is involved." This is entirely in accord with our own experience in the adult, and is just as commonly as with the child.<sup>25</sup>

Neither does our experience justify the assertion that the malady is more grave in the child, or that when gangrene occurs in early life pain abruptly ceases. When we are in doubt as to the interpretation of symptoms in appendicitis when seen early, says Talamon, we may often delay from four to five days, when peritonitis will be present. Breton notes the occasional absence of pain in atypical appendicitis of children, as is sometimes seen in adults.<sup>26</sup>

Dieulafoy, a noted clinician of great experience, is emphatic in pronouncing all well-developed cases of appendicitis in children as being exceedingly lethal. He says, the physician should note the symptoms with caution and make no delay in calling for surgical aid.<sup>27</sup>

#### ON THE RELATION OF SYMPTOMS TO PATHOLOGIC CONDITIONS.

Symptoms in disease are Nature's monitors, to warn us of the presence of lethal processes in the economy. They usually bear a comparatively definite relation to the extent and to the character of pathologic changes in operation.

There have been many attempts at the classification of the various types of appendicitis, by several authors, and it has been alleged that each is usually manifested by a fairly uniform group of symptoms. But while such a consummation is something most earnestly desired, we are yet very far from it. There are but three phases of appendicitis which, by either signs, symptoms or diagnostic evidence, can be established with any reasonable degree of certainty. These are:

1. *Acute appendicitis or peri-appendicitis in its congestive or plastic stages*, beyond which the great majority of cases do not advance, particularly in early life. The pericecal tissues share freely in the pathologic changes here. There is a well-defined iliac tumor with *peritonisme*; the knee is drawn up and the patient walks with a stooped and painful gait. There has been a large plastic effusion in the pericecal tissues, the vessels are highly engorged and lymph is freely transuded. There is a sharp but transient reaction of the constitution in a vigorous patient; but struma, syphilis, tuberculosis or malaria will protract it.

In this class we should see to it that the colon is well cleaned early by enemata, as a free alvine evacuation will often reduce all symptoms, as though by magic; with this, fever and vomiting cease; convalescence is established with increased strength.

**Vesical distension:** In this class it is of the greatest importance in young children that we shall closely look to the state of the bladder, which becomes enfeebled early and is liable to overdistension, when greater agony and danger may arise from this than the condition which

gave rise to it. In fact, it may of itself impart an aspect of forlorn hope to a case of appendicitis, otherwise comparatively harmless. An illustrative instance occurred to me some years ago. A boy of 9 years, suffering for nine days from appendicitis, was under the care of the most noted pediatricist of New York. The case taking on alarming symptoms a noted surgeon was called in consultation. It was decided that he had general peritonitis, that the case was not a proper one for laparotomy, and that there was but little hope of recovery. In the evening of the same day the case came under my charge. On inquiring about the urinary evacuation, the nurse said "he was passing urine all the time and was wetting everything." This disarmed my suspicion. But the abdomen was enormously distended; besides, it had a peculiar shape and feel; everywhere it was so exquisitely sensitive that anything like proper palpation or percussion was impossible. As the boy went under an anesthetic and spasm passed off, the greater volume of the fulness was seen inclined toward the right side, which led me to suspect a vast typhlitic abscess.

In opening through the abdomen care was taken to divide and isolate all the layers separately. This step, it was soon learned, saved us a serious accident. When the peritoneum was exposed it bulged freely into the incision. This was very carefully divided, when another smooth glistening body closely followed. This at first puzzled me. I passed an index finger into the peritoneal cavity and followed this tumor down into the pelvis, where its relation convinced me that it was an overdistended bladder. With the abdomen yet open, a catheter was passed and 51 ounces of urine withdrawn. The appendix, highly inflamed and thickened, was easily found and removed. All the pericecal tissues were highly inflamed. The boy rapidly recovered, but he would have equally as well and more rapidly had catheterization alone been performed.

Another somewhat similar case came under my care two years ago, in Mamaroneck, N. Y. Dr. A. H. Hoerr sent for me in the evening to come up and operate on a severe case of appendicitis in a girl of 12 years. When I reached there, in the afternoon, although there had been a great change for the better, full preparations were made for the operation.

On a thorough examination of the case there was no evidence of a single bad sign nor symptom. The mother informed me that for five days her daughter had suffered the greatest agony, the pain beginning in the right groin and spreading over the abdomen, which had become distended, hard, and sensitive everywhere. Thirst and vomiting persisted, and rest or sleep was impossible without large doses of morphin. But at midnight she made a desperate effort to urinate and passed nearly a quart vessel full. An hour later she rose again and passed fully a half-gallon more. Then she went to sleep and did not awaken till nine the next morning, when she had another large evacuation of urine, this time with a copious alvine discharge from the bowels.

All the symptoms had vanished and now she only craved something to eat. I saw nothing to warrant an operation at this juncture, very much to the gratification of the poor child and her anxious parent. Dr. Hoerr informs me that she was out in a week and that there has been no evidence of recurrence.

Septic symptoms sometimes accompany those cases of what I would designate "congestive appendicitis."

The modern word "sepsis," which may mean anything or nothing; next to malaria, has been made the scapegoat of diagnosis in nearly every conceivable malady. In appendicitis it calls up in the imagination pools of pus, a decomposed, rotten appendix; while we remain quite unmindful that there is often at the bottom of this sepsis an overdilated paralyzed colon, filled with a germ-laden, foul mass of impacted feces. Let us not be deceived into overlooking the state of coprostasis because there is some looseness; as in some of the worst cases of impaction, it is the most marked. These cases all call for a digital examination of the rectum. Mr. Thornley Stoker of Dublin has called attention to the importance of a critical examination of the colon and rectum in all these cases.

2. *Appendicitis with gangrenous, ulcerative perforation and suppurative typhlitis* is a lesion consecutive to the congestive form and is manifested by essentially the same symptoms, only that they are more intensified and the constitution is more seriously compromised. In this type, true septic processes are in operation in varying degrees of intensity. The appendix is the seat of vascular asphyxia, gangrene and perforation. It early forms very firm adhesions, most frequently with the cecum, and lights up an inflammation which spreads widely through the pericecal tissues. When the cecum itself is the seat of gangrenous perforation, a similar pathologic process is in operation and similar symptoms attend. Naturally enough, we look for an acute peritoneal reaction with grave disturbances of the system when mortification has seized on an intestinal structure of the abdominal cavity.

A lesion attended with suppurative changes, necrosis or rupture of a tubular structure one would presume would stir up and call forth a series of alarming symptoms, both constitutional and local. But, strange to say, in some cases of this class there are but very slight, if any marked, systemic disturbances. It has been said that perforative appendicitis is of a more insidious character in children, and that the disease possesses a more acute course with them, and hence the importance of early and definite diagnosis here. In tubercular cases, it is true, the onset may be quite insensible, but the same obtains in the adults, hence it may be said that, as a rule, suppurative or gangrenous appendicitis of various types presents no definite symptoms whatever, until the peritoneal investment is involved and perforation has begun. We know no pathognomonic symptoms in the early stage of these conditions, nor at any time during their course in a large number. Even if we did, it is doubtful whether it would avail anything for the reason that there can be no doubt, but in the great majority of suppurative or perforative cases, well localized and encysted, the peritoneum, the cellular tissues and the lymphatics are capable of rendering the effete elements of pyogenic and disintegrating changes so innocuous that their residuum may be completely resorbed and assimilated with impunity. Appendicitis of this type seldom presents urgent symptoms, except when there is fecal extravasation, when pus is formed in great quantities and burrows into the retroperitoneal tissues, or there is impending danger of the pyogenic membrane bursting and provoking a general peritonitis. In aggravated cases of this type there is nausea, vomiting and thirst, with persistent constipation from paresis of the intestine. Peristaltic tugging of the small intestine on the inflamed, imprisoned cecum produces periodical pain of the most agonizing type. This is augmented by coughing, vomiting, or any sudden

straining of the diaphragm. The pain is felt with the greatest intensity in the epigastrium, although the site of the greatest tenderness is over the intestines, the cecum and neoplastic mass. In the adult this is the most constant at McBurney's point, where the cecum is most commonly lodged; but in the infant and growing child the cecum has a longer and looser mesentery which permits of a considerable degree of movement toward the median line; moreover, it has not yet fully descended, and hence McBurney's point in early life is too low down and external to fall over the underlying cecum. When the appendix is lodged under the cecum, and is practically extraperitoneal, the suppuration following perforation may penetrate deeply behind the pelvic fascia; there is an absence of a defined tumor; purulent absorption gives rise to symptoms of septicemia, to a low grade of fever with diarrhea, exhaustive sweats and emaciation. These are the cases which may be confused with or mistaken for typhoid fever. Invariably the system is in a state of toxemia (septic), so that even though a laparotomy be performed and the decomposed purulent material evacuated, septic symptoms yet linger and the patient may sink. If recovery follows it is tedious. In fact, some of these grave cases are so profoundly septic and the degree of cardiac exhaustion is so great that late operation brings no relief.

The constitutional condition is generally the main guide to rely on in the average case of encysted typhlitis or appendicitis. The presence of a small iliac tumor gives one little apprehension, if severe pain is absent; there is no vomiting nor thirst, and marked muscular rigidity is absent. Resolution in many of these cases is as rapid as the onset. The first, most salutary symptoms of this are loss of thirst, the cessation of pain, a large free action of the bowels and return of natural sleep and relish for food.

3. *Perforation of the appendix directly into the peritoneal cavity* is accompanied with redoubtable symptoms. They may set in suddenly or gradually, and are dependent on a general peritoneal infection of all the serous structures in the abdomen. It early spreads outward through all the tissues in the abdominal walls. The entire intestines and the bladder are paralyzed. The abdomen is flat, hard, and everywhere highly sensitive. The pain is most agonizing. The patient vomits great quantities of bile and suffers from an insatiable thirst. The pulse points to a flagging heart and the cadaverous, shrunken features of the patient often portend mortal changes near at hand. This is the final close of grave appendiceal cases, said by Dieulafoy and some other authors to be most frequent in children. This, if borne out by ample support, should suggest the great importance of a correct interpretation of the symptoms at the very earliest stage of the malady, that prompt surgery may cut it short, while yet an operation may be safely supported. Could we by any symptoms determine with any degree of certainty when a gangrenous appendix opens into the general cavity of the peritoneum, probably every life might be spared. It does not appear clear whether in all these cases they were first of the encysted variety just considered, the pyogenic wall giving way around them, or whether the gangrenous appendix at the very outset opens directly into the peritoneal cavity. Some authors claim that on the appendix opening into the peritoneal cavity there is marked shock and great prostration, but this has not been my experience. With the escape and diffusion of fecal fluids and gases there can be no doubt that the general



spread of infection extends over wide areas and is attended with an intensity in the symptoms proportional to the extent of pathologic changes. But, except in rare cases of the fulminant type, it is probable that after a small perforation the leakage is gradual and we have no sharp peritoneal reaction or grave symptoms until infection is generalized. The most constant and harrowing symptom of acute general peritonitis is pain; and no description of pain so quickly crushes the spirit of the stoutest and paralyzes the heart as that suffered in this disease. This must be relieved at all hazards, or all is lost. The temperature and the pulse fairly presage the progress and the termination of the malady. With the subsidence of the pain and a fair share of sleep or tranquility, thermal and vascular symptoms show signs of abatement.

Extreme restlessness, great thirst and a flitting, feeble pulse point to a state *in extremis*, when the case has passed beyond all human aid and the end is near.

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- \* The Bronx is a district on the north, recently annexed to New York.
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## IS IT POSSIBLE BY PROPER DIETETICS AND HYGIENE TO EXTERMINATE TUBERCULOSIS?\*

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I am aware that the literature on prophylaxis of tuberculosis is already very complete and contains more suggestions than we are willing at all times to take the trouble to thoroughly carry out; but the paramount importance of the subject, as shown by the terrible inroads being made upon the people of all lands, is my plea for bringing these considerations before the members of this Section, with whom rests most of the responsibility of educating the people to rid themselves of the ravages of the disease.

It is now nearly twenty years since the discovery of the bacillus of tuberculosis by Koch. During this time many of the world's greatest scientists have labored incessantly to conquer this microscopic enemy of mankind, and destroy its effects. The history-making in

all departments pertaining to tuberculosis has been rapid, and the data collected are of the greatest value. The causes have been surely demonstrated, the prevention is fast becoming an exact science, and the treatment is every year being improved, though yet far from what we could desire. At one time it was thought that a specific had been found. The press of the whole world was filled with praises for the discoverer, and it seemed fitting that to him should come this great honor. He had shown the existence of the germ, why should he not find the power to destroy. Soon it was learned that too much had been expected; more, indeed, than the investigator had claimed, for the new germicide proved to be impotent. Since then we have perhaps grown wiser and very few are now looking for a specific cure.

In spite of our better knowledge and treatment the disease has, in the meantime, at least been holding its own, or perhaps gaining ground. So great has the peril become that we can no longer consider simply the individual case, our attention being more and more directed to the saving of the people. This was shown when the invitation was extended to attend the International Congress in Berlin last year. The wording showed the issue—*Kongress zur Bekämpfung der Tuberculose als Volkskrankheit*.

The chief conclusions in this Congress, and also in articles in the symposium on tuberculosis, at the fiftieth meeting of the AMERICAN MEDICAL ASSOCIATION, were that the disease is not hereditary but acquired (Virchow<sup>1</sup> says: "I now positively dispute this heredity"); that to cure a large percentage of cases, the diagnosis must be made before destruction of the lung tissue has begun; and that by far the surest, and consequently the most important consideration is the prophylaxis, through public and personal hygiene, and the maintaining a high degree of general healthful conditions in the individual.

Neither in the Congress nor in the AMERICAN MEDICAL ASSOCIATION meeting was any method of treatment given which was expected at all to cope with the disease unless the cases could be seen in the very earliest stages. Many are curable if diagnosis is made early enough and proper treatment at once instituted. An analysis of several thousand treated in high altitudes shows that the average percentage of cures in the first stage is 65 per cent, and in the second and third combined, only 15 per cent.<sup>2</sup>

Granting that eventually our treatment can be improved till all cases can be cured, very few realize at what tremendous cost this cure is accomplished. Based on the figures of Knopf, that the cost of a tubercular charity patient in New York is \$522, Evans<sup>3</sup> estimates "the cost of tuberculosis in the U. S. \$574,000,000 each year, and that tuberculosis kills 152,000 people in the U. S. each year. In the late war there were killed in all directions and in every way, 6300 people, while the war loan for the prosecution of the last war was \$150,000,000."

But I wish to call attention to another cost which is much greater, for which one of us would not willingly pay any sum which he could command, if he could ease the suffering and restore the health of one dear to him. We are all too familiar with this cost of mental and physical suffering, deprivations and exile from home.

Granting, then, that a cure is possible in every case, is not the cost and sacrifice too much, is it not better that the emphasis be at once placed where it belongs, and that is on the prophylaxis?

\* Read by Title in the Section on Physiology and Dietetics, at the Fifty-first Annual Meeting of the American Medical Association, held at Atlantic City, N. J., June 5-8, 1900.