observed that those men who are over 30 years of age have some defect of vision.

There is another point in regard to hearing. We find men in the engineering department—I mean the locomotive engineering department—employed as either firemen or otherwise, in the machine shops, who have defective hearing so far as the watch is concerned. In some cases they can hear a watch tick only eight or ten inches, in one case I recall only four inches, and in another the man could only hear the watch tick two inches distant from one ear, and not at all with the other ear; yet the hearing at a distance did not seem to be materially defective. I requested this last candidate to have a specialist examine his ears and determine whether or not there was any disease of the organ. The aurist returned a written report saying that there was no disease of the ear, and that the watch test was not a fair one in this case; that he could hear eaaily at a distance of twenty feet, whereas he could not hear the watch at all with one ear, and with the other only a distance of two inches. The opportunity of making these examinations has revealed to me a risk which railway companies have taken heretofore in employing men in this capacity, so far as their physical condition of hearing and seeing is concerned.

Dr. Owens (closing the discussion)—This matter of examining applicants for the railway service is an exceedingly important one, and I might say that an examiner is not made in a day. When I first took the matter up, it took me some three months to investigate it, before I felt justified in doing this important work. Now, we have examiners on our roads who do not really know how to examine these men. Perhaps I ought to be ashamed to say it. I know they will be able to do it after a while. The reports come to me and I pass on them. If there is anything wrong we rectify it in some way. How can we get our examiners to thoroughly examine these applicants? In the first place the matter must be thoroughly studied. I have recently come in contact with the report of a committee of the Royal Society of London on this subject. It takes the subject up in all its relations, criticising the methods of the Board of Trade which seem to be so very defective that they were not accepted at all. It is one of the most valuable pamphlets on the subject that I know of. Then there is a book just issued, the "Dalton Lectures," which treats of the subject of color blindness. There are various text-books on diseases of the eye that one may pick up, but they do no not go into the subject of color blindness to a sufficient extent to enable the examiner to do his work well. I intend to get a number of these reports and will have the surgeons connected with our roads procure them through us.

It is said that applicants who have made some mistakes with worsteds are able to name the colors of the flags and the lanterns correctly. The question is whether a man who makes mistakes with worsteds and does not in the case of flags and lanterns should be accepted. That throws into the examination the naming of colors which is a defective method. On the Illinois Central Road the examinations were made first with worsteds, and then Mr. Jeffrey ordered that the examinations be repeated, and the applicants were examined with flags and lamps. I was timid as to the efficiency of the latter method. My assistant, Dr. Allport, of the Illinois Central Road, has examined many applicants with flags and lanterns, as well as with worsteds. The conclusion has been reached that men who are color blind with worsteds will make mistakes with flags and lanterns.

Forty Thousand Acres of Land for Insane Asylum.—One of the acts of the South Dakota Legislature in 1895 was to appropriate and set apart for the use and benefit of the Northern Hospital for the insane, forty thousand acres of the land granted to that State for "other educational and charitable purposes."

APPENDICITIS; PROTEAN TYPES.

Read before Jackson County Medical Sociey at Kansas City, Aug. 22, 1895.

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KANSAS CITY, MO.

To the members of the Jackson County Medical Society a paper on appendicitis may, on first thought, seem a trite topic for discussion, yet when the many phases of this treacherous disease are called to mind we at once realize that it is a topic the importance of which demands oft repeated discussions, that a more unanimous opinion of the pathology of the disease may be obtained, and its proper treatment better understood. In the face of our more advanced and modern pathologic knowledge we yet have conscientious practitioners who claim that they have never seen a case of appendicitis, and another class also exists, that admit having cases, but claim the ability to cure them, denying the probability of a death from the disease. A still more liberal class may be found that is willing to meet the surgeon halfway and become associated with him in the case, waiting and watching for the so-called operation indications to spring up. It is just this delay, too often, that results in the signing of a death certificate. A few days ago a very intelligent, thoughtful professional gentleman (a minister) met me on the street, and referring to a late case of appendicitis upon which I operated said, "I am glad to hear that one case of appendicitis has recovered after an operation." It has crept into the minds of not only the laymen but of the profession, in many instances, that the mortality from this operation is high. This deduction is in part correct, but thanks to the converting evidence of the post-mortem and operating tables the deaths from delayed surgery are of less frequent occurrence than formerly. If any one disbelieves in the advisability of operating in appendicitis in almost every case, he will quickly change his views if present at a number of operations, or if he witnesses a few post-mortems on patients dead from the disease. I do not believe that every patient with a pain in the region of the appendix should be subjected to laparotomy, but I do think that when the diagnosis of appendicitis has been made, if every case was operated upon by a skilled surgeon, the mortality from the operation and the disease would be almost *nil*. A great and dangerous mistake is often made in waiting for the operation indications, as they are usually called, to spring up in these cases. Every case of appendicitis is symptomatically an individual, and the surgeon or physician who looks for a stereotyped case will hunt a long time before the case will be found that exactly tallies in its manifestations with a book description. A large and varied experience engenders the best judgment in correctly interpreting the manifestations of the protean types of this pathology; not only experience in seeing the cases from a practitioner's point of view, but from the surgical and pathologic.

A bright but decidedly conservative practitioner once told me, as I was making preparations to operate on on appendicular abscess, that if the subject was his child he should not be operated on, but after witnessing an operation that revealed a large amount of stinking pus, and a gangrenous appendix, he at once turned over a new leaf, and I have since operated upon three cases for him, with success in all four cases.

In the catarrhal form of the disease a symptomatic transient lull is often noticed, but sooner or later a recurrence of greater or less severity supervenes, and the sufferings and dangers incident to a relapse are repeated. In this form of the disease the mucous membrane of the appendix is primarily influenced, the subsequent attack invading more and more deeply the muscular and other structures of the appendix, thickening its walls, cutting off the proper blood supply by these interstitial infiltrations, obstructing the proximal end of the canal at Gerlach's valve, and inducing an extra amount of secretion into the distal portion; this in turn becomes infected usually with the bacterium coli, and a simple catarrhal change is converted into a septic purulent one, to be followed by local (perforation) or general (gangrene) death of the organ. It has been the exception, not the rule, that I have found a foreign body in the appendix. In one case I found an orange seed, in another a peanut kernel, and in another a piece of chewing gum.

This inflammatory change is prone to attack the subserous tissue and lead to an abundance of exudation, the first step nature takes to protect the general peritoneum. This inflammatory edema extends to the surrounding peritoneum, agglutinates the surfaces, and thus adhesions are formed, nature's barrier. If there is only one attack, and if that spell stops short of suppuration, the veil-like adhesions are absorbed. If the case was a catarrhal one the changed walls of the appendix approach the normal again, and the appendix may get entirely well, or more likely be ignited at some future time, or number of times, ultimately proving fatal.

A fecal concretion is often the cause of a perforation or gangrene of the appendix. The inflammatory forerunners are protective processes and are not of a truly septic character in the initial stage, and it is to this fact that we must attribute the prophylactic building of these barriers. A truly septic peritonitis rapidly spreading is not preceded by these limiting sentinels, consequently is rarely limited. A perforated appendix, liberating large quantites of septic matter into the peritoneal cavity, unless removed quickly, and followed by the most careful toilet, inaugurates a fatal form of peritonitis. They die, if not saved by surgery, as quickly as by a perforated gunshot injury to the intestines.

In a case of appendicitis, primary or recurrent, can we tell whether a perforation is going to take place or not? I say no. Can a large per cent. of the cases be looked upon as dangerous from the time a diagnosis is made? Yes. Have we a remedy in the list of drugs for which any one has claimed that it will prevent or cure an appendicitis when once developed? No. Is the mortality from the operation, when done timely, high? No. In what class of cases of appendicitis is the mortality following an operation highest? In cases where hot stupes and large doses of morphin have been used, and delays countenanced. Is the operation safe and easy for any one to perform? No. I know of no operation in the domain of abdominal surgery that requires more surgical skill and knowledge than that of appendicectomy. When to stop in the operation, and when to go ahead, are problems of grave import confronting the surgeon in the midst of an operation. Upon his decision depends the life or death of his patient. It is not an operation that is safe to place in the hands of the novice. It is very essential here to know what not to do, as well as to know what should be done. After an individual has had one or more attacks, and is seemingly well, has he any assurance that he is not going to have another one, or that the next attack will not prove fatal? No.

Case 1. Appendicular abscess; rupture into cecum; recovery. J. M. L., male, age 45, was taken sick with uneasiness and pain in right iliac fossa, diarrhea, temperature ranging from 99.5 to 102 F. Pulse 80 to 120. After the beginning of the attack he drifted along about as above for ten days, all the time having more or less tenderness and pain in region of appendix. A week after the beginning of the attack an induration developed over or about the cecum, not very painful on pressure. Some two weeks had elapsed when he felt a "giving away" in the mass and a few hours later passed pus and blood per rectum. The mass soon disappeared, and he is to-day up and about, attending to his professional duties.

It would be extremely illogical to reason that as this case made a symptomatic recovery others, seemingly similar, would do likwise. This case was undoubtedly due to the presence of a tubercular ulcer in the appendix, as its slow progress, abundant plastic protective barrier and the history before and afterward indicates. A diarrhea had preceded the case for months. A daughter had died of tubercular peritonitis and ulceration of the intestines, and another child had developed tubercular synovitis. This case should have been operated on early in its progress, and not been permitted to run the gauntlet of dangers incident to procrastination while waiting for nature to relieve herself. Nature is a poor physician or surgeon in appendicitis.

Case 2. Appendicitis: one mild attack: recovery. Miss L., age 16, was taken with uneasiness over appendix acccompanied with some little rise of temperature, 95.5 F., normal pulse, obstinate constipation lasting ten days, no symptoms of intestinal obstruction. All forms of cathartics and enemas given with no response: no vomiting or nausea; general condition of patient all through attack good; no induration, and very little tenderness at any time. This case was watched by myself and the attending physician right along until bowels moved well and symptoms disappeared. I contended all through the case that it was not an appendicitis, but an impaction of cecum, and advised against operative procedure. The attendant claimed that it was an attack of appendicitis, thinks so still, and has reported the case as one cured with medicines. The patient has remained well.

Women do not have the disease as frequently as men (one to six). The obstinate constipation, absence of tympanitis, the complete subsidence of the symptoms following bowel movement, and the nonrecurrence of the attack, in my mind warrants me in yet maintaining that she did not have an attack of appendicitis. Let us admit that she did, and has permanently recovered, it only serves to establish the rule by being an exception.

Case 3. Recurring appendicitis; operation in the interval of attack; recovery. H. E., age 20, male, was first attacked with severe pain in region of appendix one year ago, since which time he has had thirteen attacks, each lasting from three to eight days. The attacks have been accompanied by constipation and great distension, the latter often preceding the painful exacerbations a day or two, the tender area usually extending over a space the size of the hand but not as painful on pressure as that usually accompanying a true localized peritonitis. There has not at any time been a localized induration of the surrounding or overlying structures. The attacks have usually been marked by a slight rise of temperature (100 F.), the pulse being very slightly increased in frequency. A disposition to flex the thigh upon the abdomen during the attacks, has been a marked feature in his case, and is explained by the recognition of the fact that the psoas and iliacus muscles are relaxed while the thigh is thus passively flexed upon the abdomen. Any disturbance of these muscles causes more or less movement of the inflamed appendix through its mesenteric attachments, thus giving rise to the increased pain. The genito-crural, anterior crural and ilio-inguinal nerves being immediately (in part of heir course) beneath the peritoneum, were more or less disturbed in this case, as manifested by the referred pains in the course of their distri-

bution. During the acute attacks he has been treated by as many as six physicians, in three States. Some of the six are probably reporting this as a cured case of appendicitis without surgery. The attacks were so severe that he would barely throw off the effects of one until another exacerbation would supervene. The appendix could easily be rolled under the finger before operating. Operation July 3, 1895. The appendix was found to be greatly thickened and indurated as a sequela of the repeated attacks of inflammation. Its walls were one-fourth of an inch thick. The operation was performed in the interval of the attacks. His recovery was perfect.

This is one of the most dangerous forms of the disease, as the repeated attacks bring about vascular and other structural changes that favor the death of the appendix (gangrene) and that, too, with no walling in by the protective surrounding adhesions.

Case 4.—Appendicitis obliterans, followed by symptoms of intestinal obstruction. H. G., male, age 28, nine years ago had an attack of what he called inflammation of the bowels, and his right side "caked" and was extremely tender. He had a high fever, and was very sick for a number of weeks. This soreness and pain continued with varying intensity up to the next attack, one year later. This is a diagnostic feature of this form of appendicitis; that is, the soreness and tenderness persist in the interval of the attacks. This second attack was very much the same as the first, lasting three weeks. After this relapse he had fairly good health for four years, with the exception that there was always uneasiness in the region of the appendix and many attacks of what he called "colic" and indigestion, often having to resort to cathartics to keep the bowels regular. At the end of this four-year freedom from severe attacks another "spell" was initiated by severe pain in the region of the appendix and "back ache." Had fever, increased pain and tenderness, lasting two weeks, leaving him seemingly in about the same condition as before. He was often troubled with gas pains and distention, and had "colic spells." He had several mild attacks between the last severe attack and last June, or four years after last severe spell. In June he came down with a severe attack very much like previous paroxysms except that the tenderness was less, no tumor was discoverable and that he had much more gaseous distention and difficulty in getting his bowels to move. Soon after this sickness I saw him, and advised an operation.

I found the appendix atrophied, and its canal completely occluded (appendicitis obliterans). Length of appendix about one and one-half inches. It rolled under the finger like a tendon or a fibrous cord. An inflammatory band the size of the finger was attach to abdominal parietes near internal ring and crossed a coil of bowel and attached itself to the mesentery, thus making a partial intestinal obstruction. This was divided and the appendix removed. He left the hospital in two weeks, and has been entirely relieved of all his painful symptoms.

We have in this case one of the best appeals for an operation in all similar attacks in view of the prolonged suffering and dangers incident to these repeated attacks, and the damage wrought by the delays. Each attack that this man had, endangered his life far more than an operation in skilled hands, having in view a permanent cure and relief for his sufferings.

Case 5.—Appendicitis; gangrene of the appendix; operation; recovery. A. K., male, age 20, was taken on a Saturday night with pain and uneasiness in right iliac region, the pain extending down the inner side of the thigh and in the course of the distribution of the external cutaneous and genito-crural nerves. Very little elevation of temperature (99.5); pulse 84. Hypodermics of morphia were given by the attending physician. The pain and his general condition remained about the same up to Monday afternoon, when I saw him for the first time. Pulse 92 full and "vicious." Temperature 100.5 degrees F. Bright and cheerful except when pains would come on caused by any peristalsis of bowel or movements of thigh. Bowels acted during the night. Tenderness over area size of hand and a false sense of induration over appendix due to rigidity of the abdominal muscles. This condition is often misleading, and added to the edema that frequently attains may be easily mistaken for a walled-off intraperitoneal mass or abscess. At the operation the appendix was found to be gangrenous and entirely free from surrounding protective barriers. His recovery was complete.

Without an operation his blood-vessels would have been filled with embalmer's fluid within thirty-six hours. An appendix with no walling off, when gangrenous or perforated, kills quickly unless the surgery is immediate.

Case 6.—Appendicitis, recurring, with symptoms of bowel obstruction due to adherent appendix; operation; recovery. Mr. N., aged 44, has had a number of attacks lasting from a few weeks to two months. After last attack, six months ago, he has repeated colic spells, accompanied by obstinate constipation. The cecum would become enormously distended with gas, resembling, as he described it, a croquet ball in size. Operation revealed the appendix long and hard to the touch (appendicitis obliterans in its early stage). The distal end was firmly attached to the iliac vessels. It was ligated near the cecum and again near its distal extremity and removed. The position of the appendix was such that it was pulled upon when the cecum became distended and added to the cause of the symptom producing attacks simulating bowel obstruction. His recovery was complete. He has had no return of his old painful attacks.

Case 7.—Appendicular abscess; operation; recovery. W.K., male, aged 19, was taken down one week before I saw him with fever 102. Pulse 80 to 96. Pain and tenderness gradually getting more severe; constipated bowel, tympanitic; well marked induration in region of appendix. Operation consisted in simply opening the abscess, packing with gauze and leaving wound open to granulate from bottom. Recovery in a few weeks.

This case was one in which nature had time to wall off the appendix before it perforated, but the barrier sooner or later would have been torn down and a death from peritonitis recorded.

Case 8. Perforative appendicitis; immediate operation; recovery. Mr. Wilson, aged 22. This man, stout and healthy was taken with most intense pain in iliac fossa, accompanied by a subnormal temperature (shock) but with a pulse of only 90. Abdomen distended. A diagnosis of perforative appendicitis was made and operation performed within two hours of the development of the symptoms of perforation. He had been having an "uneasiness there for three days." A septic peritonitis was already inaugurated, but a thorough irrigation with a normal saline solution and gauze and rubber drainage saved him.

Case 9.—Perforated appendicitis followed by a diffused septic peritonitis; operation two days later; death. Miss H., age 16. A lovely young girl, had been complaining for a week, with pain or uneasiness in the region of the appendix. Constipation; little elevation of temperature. Two days before I saw her a most intense pain was felt about the cecum followed by a condition of shock from which she soon rallied, but the pain spread rapidly over the abdomen. This subsided in eighteen hours. At the time I saw her she had a pulse of 90; temperature 100.5; free from pain except a sense of distension in abdomen; was bright and cheerful; insisted, in fact, upon getting out of bed and having her photograph taken standing, not over half an hour before the operation. These septicemic patients often manifest this cheerful disposition up to within a few moments of death. Operation revealed a diffused septic peritonitis, with a perforated appendix. The intestines were as lifeless as a rubber hose. The abdomen contained fully half a gallon of septic fluid. Irrigation and drainage failed to save the case because her diaphragm, spleen and liver were bathed in pus, and she was thoroughly saturated with the products of bacterial chemic changes.

An early diagnosis and speedy surgery would have saved this case, also. With the laymen operations on dying patients bring reproach to surgery because they fail to save the cases. This is true not only with the laymen but with some members of the profession. To me it seems that there are no plausible grounds for a diversity of opinion as to the proper course to pursue in the management of these cases when once a diagnosis is made. Let us, as practitioners and surgeons, get together on this subject. It is not necessary to provoke any ill feeling (which I have often seen done) in discussing this topic. Let our deliberations be friendly and gentlemanly, and sooner or later the truth will prevail and our patients will reap the beneficient harvest, the fruits of our mutual deliberations.