

protect from burns, no matter how careful and expert the operator may be. The danger is, however, very slight. At the present time I am using a 4-inch coil for my work—a coil which I have had constructed on special lines. I find it sufficient. The spark has volume and sufficient length to overcome the resistance of the tube. It is the volume in the secondary discharge that is essential to good *x*-ray work.

The point I would like to emphasize particularly in reference to my paper is that I have here a method which determines accurately the position and presence of calculi and the size of those calculi, making it possible for us to leave to Nature in selected cases what she often accomplishes. The fact that there are more ureteral calculi than we had supposed shows Nature's tolerance of them. The same is as true here as in the papers brought out on the biliary calculi. There we find calculi quiescent until some infection lights up and aggravates the condition present and shows the presence of the calculi.

DR. D. N. EISENDRATH, in reply—I agree with Dr. Porter, and in answer to Dr. Means, in regard to the fact that infection is, in the great majority of cases, the first symptom, or is the cause of the first symptoms of the presence of gallstones; a patient may have gallstones, as shown by Kehr and a number of investigators; they may go through an entire lifetime without having become aware of their presence, but when infection begins and the patient has a cholecystitis or cholangitis that causes, as Riedel has shown, an inflammation around the foreign bodies; there is contraction of the gall-bladder muscles and common-duct walls and, as a consequence, the patient has gallstone colic, but the stones are seldom expelled. As to the question icterus, we can distinguish between the two varieties of jaundice. There is the inflammatory jaundice which is of slight degree and which is almost invariably present during the course of gallstone colic and is known as the inflammatory icterus, in which there is a small amount of absorption of bile by the gall-bladder walls; and so-called obstructive icterus, in which the obstruction is caused by a stone, usually in the common duct.

I desire to relate some interesting experiments made by the Japanese investigator Miyake. He found that when he injected virulent colon bacilli in the gall-bladder of animals he produced no change, except a slight catarrhal change in the gall-bladder. If partial obstruction of the common or cystic duct is produced, particularly the latter, by passing across it a portion of the omentum to obstruct it, or ligating it incompletely in other words, and then, at the same time, one injects micro-organisms into the bladder, we have the two conditions now recognized to be essential in the gall-bladder infection plus obstruction to produce stones. These are the clinical causes. In two dogs, after the lapse of nine months, and twelve months, in another case, he produced gallstones which, upon analysis, had the typical composition of such calculi; that is, the experiments have proved what we have known since 1891, when Nauyn first proposed the stone-forming theory, that stones are not due to acid precipitation of bile, but that the colon and typhoidal bacillus and the resultant catarrh is the most frequent cause.

In regard to primary suture in gallstones, I think it is the general opinion of men who have had experience—from 400 to 600 cases each—as Mayo, Robson, Kehr and Riedel, that we ought to abandon it as a routine procedure. It is dangerous to close the gall-bladder in every case. It is better to do one of two things: either obliterate the gall-bladder entirely by cholecystectomy, or follow the procedure of the majority of surgeons and drain the gall-bladder, in that way getting rid of the infection. Peterson has shown in cholecystitis purulenta, that the examination of the bile escaping from the fistula shows at the end of ten days that the bile is sterile, so that by such perfect drainage we can obtain good results. In answer to Dr. Bernays, I would say that in our case there was positively no peritonitis. The condition of the liver and the slight obstruction caused by the stone which was lying in the diverticulum of the cystic duct, the lack of escape of fluid, and chiefly the condition of the liver, was the cause of death.

DR. J. B. BULLITT, in reply—I am familiar with some cases of empyema of the gall-bladder, which, through rupture, have produced abscesses of the abdominal wall. I purposely omitted this class of cases in my paper, for the discussion of all cases would lead us too far. I believe that the experience of the last few years has demonstrated that stone in the kidneys and ureters is of much more common occurrence than had before been believed. I believe further that the chapter of kidney surgery has expanded most wonderfully in this time and is destined to expand more rapidly and to be reckoned in the next decade in the brilliancy of its results with the surgery of the gall-ducts and appendicitis. I find that there has not been so much work done which will reflect so much credit on this particular chapter of surgery, and which will be of such benefit, as the light which has been thrown on this matter through the means of the *x*-rays, and of all those workers who have added their knowledge to this chapter in surgery, no one is entitled to as much credit as Dr. Leonard. I have, for several years, worked in the kindergarten of the *x*-ray and I think the difficulties to be encountered by one who undertakes examinations by these means are very great. Of all the operators in this country there have been comparatively few up to the present time who have developed a technic which is sufficient for making a positive and negative diagnosis. I believe the time is fast coming when the accumulating experience of men will prove that we shall have this safely at our command.

Dr. Bevan has laid stress on the fact that as far as the determination of kidney stone is concerned, the *x*-ray is more important than the operative exploration of the kidney. He has reported one, perhaps two, cases in which kidney stone had been expected, in which an exploratory operation had been made. The kidney had been incised and the pelvis explored. The kidney had been needled in all directions and no stone had been found. The symptoms persisting, the patient was afterward submitted to the *x*-ray and a very clear and distinct shadow of a stone was found. I have had a similar experience, although not with a kidney in situ, but one that had been removed on account of extensive destruction, from a large kidney stone in the pelvis of the kidney. Desiring to experiment with the shadows, I placed the kidney on a photographic plate and made an exposure and was very much surprised to find on developing that the shadow of a second stone was present on the plate. I exhibited this stone before the Surgical Society in Louisville and opened the kidney over the point indicated by the shadow and found there a second stone which had not been found at the time of the removal of the kidney. If this method of Dr. Leonard were followed, mistakes could not occur. If a patient is operated on after a stone has been determined in this way, it will not be possible to remove one stone and leave another in place.

Concerning the term "*x*-ray burn," we all know what we are talking about. All of the various types of apparatus are capable of producing burns. I have used the static machine, the Tesla coil and the induction coil. I have never produced a burn in anyone but myself and that was produced by means of the static machine.

Clinical Report.

ANKYLOSTOMIASIS—REPORT OF A CASE.

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This being one of the few cases of ankylostomiasis to be reported in this country, I present it to the profession.

The patient, J. O'R., aged 38, an Englishman, was employed as a sailor on a vessel plying between Liverpool and cities in the United States. On his last trip the vessel touched a port in Mexico (Vera Cruz) a few days before entering any ports of the United States. Whether or not the man visited other ports or was subjected to circumstances conducive to the contraction of this disease could not be ascertained. He arrived in Baltimore about the last of September, feeling extremely weak and debilitated and suffering from some obstinate

intestinal trouble. In consequence of this general condition he abandoned his return trip to Liverpool, entered a sailors' boarding house, and after remaining there for three or four days was admitted (Oct. 2, 1901) to Bayview Hospital. The history gained elicited the fact that he had been suffering from general malaise and debility for about six months prior to his arrival in this city. He had commenced to lose appetite and energy the latter part of the spring, and this condition gradually developed into a general disability.

About a month ago his symptoms became more grave, a troublesome bowel disorder ensued, the discharges at times being tinged with blood. However, he was not compelled to abandon work until he reached this city in September. At the time of his admission to the hospital his condition was at once considered grave on account of the emaciation and anemia. A dry cough was noticed. His temperature on admission was 100 F. and varied between this point and 98 throughout the course of the disease. The evening temperature was about a degree higher than that of the morning, thus simulating a tuberculous condition.

The physical examination elicited the following: The face was emaciated and pale; the eyes were bright, pupils somewhat dilated, reacting normally to stimuli; conjunctivæ pale; tongue was coated white and the breath was offensive. Clavicles and ribs were prominent; skin free from eruptions, and very pale. Palpation and percussion elicited nothing abnormal. On auscultation a few sonorous, sibilant and mucous râles were heard distributed pretty generally over the chest. Respirations were 24 per minute. Dyspnea was quite marked at times. Heart sounds were weak, and pulse 100 per minute. No increased dullness was evident on percussion. A hemic murmur was occasionally heard over the apical region. There was no increased hepatic or splenic dullness. Pain points were evident over various portions of the abdomen on palpation. No lumps were found in the abdomen. The reflexes were normal. The whole body showed marked anemia and emaciation. There were no signs of edema. The urine was pale in color; specific gravity 1016, contained no albumin or sugar. The sputum was frothy, but contained no evidence of tubercle bacilli.

These symptoms suggested either amebic dysentery or tubercular enteritis. A microscopic examination of the feces was made, but nothing was found to confirm our suspected diagnosis. There was found, however, in addition to blood, certain strange-looking ovoid granular bodies, much larger than red blood corpuscles, the true character and source of which was not recognized, and in fact very little importance was attached to their presence.

The postmortem examination revealed, as will be noted below, that these bodies were the eggs of the parasite *ankylostomum duodenale*, the true cause of the disease. An examination of the blood was made two days after the patient's admission to the hospital, with the following results: red corpuscles, 2,500,000 per cubic millimeter; white corpuscles, 24,000; stained specimens showed a great increase in the polynuclear leucocytes and eosinophiles, the relation of the eosinophiles being 26 per cent. A small percentage of nucleated reds were found present, of the microblastic and normoblastic types. Poikilocytosis was absent. The general size of the red corpuscles was about normal; however, a few microcytes and macrocytes were present, the former predominating. A few days later the second examination showed a slight increased leucocytosis.

The pains in the abdomen were of a dull, nagging character, with an occasional paroxysm of great severity. About two days prior to death a final blood examination was made, with the following results: red corpuscles, 800,000 per cubic millimeter; white corpuscles, 29,600; hemoglobin, 11 per cent. Stained specimens at this time showed an increase in the nucleated reds. A slight poikilocytosis was now present, with some increase of microcytes. The most striking change was the increase of the polynuclear leucocytes and a decrease in the eosinophiles, the eosinophiles now only aggregating 3 per cent. A few lymphocytes and large mononuclear leucocytes were to be seen.

From this time on the patient rapidly failed. Respiration became more labored and gradually decreased in frequency, and he died on the evening of Oct. 19, 1901. An autopsy was made the next day by Dr. Yates, of the Johns Hopkins University. A brief summary of the findings being as follows:

Body was marble white in color, slight rigor mortis present 18 hours after death. Peritoneal cavity contained an excess of clear fluid, but the surfaces were smooth and glistening. The pleural cavities contained some turbid-looking fluid; no apparent congestion; some old adhesions to posterior chest wall. Lungs were edematous on the dependent portion; much black pigmentation of the tissue and old tubercular foci were present. The bronchi contained much frothy fluid, with no evident congestion of the mucous membrane.

The pericardial cavity contained a small amount of clear fluid. The blood clot in the heart was pale and tenacious; cut section of the muscle gave evidences of fatty degeneration. The valves were apparently normal. There were also evidences of fatty degeneration in the liver and kidneys. Extreme paleness of all viscera was present.

On opening the intestines about five or six inches from the beginning of the duodenum, a hemorrhagic-looking substance was found, small in amount. On close inspection of this substance there was revealed numerous small whitish worm-like bodies averaging from 7 to 16 mm. in length. As we opened the tract downwards the same condition existed until about 6 feet from the origin of the jejunum a more striking condition was encountered. These little worm-like bodies were now found to exist in great numbers. They were noticed to be in a living condition and many attached to the mucous membrane. They were thought to be the *ankylostomum duodenale* parasite which, after microscopic examination, proved to be correct. These parasites were abundant down to the colon and a few extended as far as the rectum.

The stomach contained no parasites. The entire intestinal canal was bathed in a tenacious mucus. The mucous membrane was pale, with here and there slight hemorrhagic areas. Along the free margin of the valvulæ conniventes greater hyperemia was noticed.

The microscopic examination of the bowel contents revealed large numbers of the previously mentioned ovoidal bodies. They were now recognized to be the eggs of the parasite, and the supposed granular condition was known to be various stages of segmentation. Had we been fortunate enough to have recognized the eggs found in the antemortem microscopic fecal examination a correct diagnosis would have been reached and proper treatment employed, resulting possibly in saving the man's life. This illustrates the necessity of making a thorough microscopic fecal examination in all intestinal disorders, when associated with marked anemia.

Quantity or Quality?—It is plain that the medical college which adopts as its motto, *quality rather than quantity*, must have either a large amount of virtue or a small amount of endowment, or some of both. The lower the standard of admission and the quality of teaching, the poorer it is, either in virtue or endowment. There is at present a rage for large classes in our literary colleges that is an ominous sign of education debasement. The college president who succeeds in swelling the numbers in the classes is held to be the most "successful." That Williams College thinks otherwise and prefers by elevation of her standards to lessen the mere number of her matriculants is a hopeful sign. A number of our medical colleges are like-minded, and in view of the fact of an already overcrowded profession, with a future lessened function, it is the clear duty of every physician to encourage those schools whose standards are in advance of others. Every established physician is asked by young men whether he should study medicine or not, and at which college he should matriculate. So long as the poor commercial college is advised so long will our present educational disgrace persist, and so long does the fault lie at our doors. We have the cure of our special evil in our own hands. We must starve the low-standard commercial medical college to death or to decency.—*American Medicine*.