hypoblastic structure. I do not agree with Dr. von Adelung that all children who react to tuberculin should at once be treated with tuberculin. The fact that 95 per cent. of children in certain communities will react to tuberculin at the age of 12 should be interpreted as Nature's crude way of vaccination. The hypersusceptibility produced is in a certain degree protective to further infection.

DR. CHARLES A. SHEPARD, Needles, Cal.: I have used atoxyl for years in these cases. I have never seen any harm result, but I employ a much smaller dose than others have advocated, using only $\frac{1}{4}$ to 1 gr.; I think it is of great benefit as an addition to tuberculin in producing phagocytosis. I think tuberculin is a most valuable agent used as a prophylactic in children whom we find to be tuberculous. In answer to Dr. Webb, we did not measure the difference in the antibodies intravenously and subcutaneously. We simply went by the signs of reaction.

A PLEA FOR LARGER INCISIONS AND MORE THOROUGH EXAMINATIONS IN ABDOMINAL SURGERY *

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While some surgeons make ample incisions and a thorough examination as a matter of routine, there are many more who do not do so, and it is with a hope of being helpful to this latter class that this paper is written. The average surgeon is prone to do his abdominal work through too small an opening. He points with pride to an inch and a half scar after an appendectomy, and a two and a half inch scar after an operation for the relief of pathologic conditions in the pelvis.

We acquired this habit, first, because of our earlier experiences with ventral hernias, which were not uncommon in the practice of every operator, in which, naturally, the smaller the original opening the smaller the subsequent hernia. Then men with dextrous fingers vied with each other to see who could do his work through the smallest opening. With our improved technic stitch abscesses and infected wounds are practically eliminated, and a ventral hernia is a rare sequel; hence this reason for a small opening no longer obtains. It would be very discomfiting to us if we could fully realize how often we have left unrecognized pathologic conditions because our opening was too small to admit of a proper examination, and because we had not acquired the habit of making a thorough examination of the whole abdominal contents in every instance.

When made at one of the accepted points of election there is no valid reason why an opening should not be amply large to permit the introduction of a hand, and, if need be, an arm, for a thorough exploration of the most remote corners of the abdominal cavity. It is infinitely better to make the opening large enough to admit the hand without force than to confuse the edges of the wound by a forcible introduction of the hand or with retractors. Faulty wound-healing has very often been due to too great or too prolonged pressure from retractors, or to forcing a tumor through too small an opening.

With our present technic a large opening will heal just as surely and as perfectly as a small one, and there can be no objections to the larger opening except those based on our former and less perfect technic. Our natural prejudice against a long cicatrix for esthetic rea-

sons, is no longer tenable because the objection is only a fancy, while the fact is that we can do our patients much better service through a longer incision. The laity are now so accustomed to abdominal scars that the size of the scar is no longer a matter of importance to them.

At one time I was quite proud of the fact that I could remove an appendix through a McBurney incision just large enough to admit my index-finger. My pride sustained several serious jolts, however, when I was called on to perform a later operation for the relief of conditions overlooked at the first one. Doubtless many other patients who were not relieved by my esthetic operation went to other surgeons for relief, the result being that I was discredited and my patients were subjected to the suffering, danger and expense of a second operation, and had two scars instead of one, all for the sake of a dainty little scar in the first instance. Every surgeon present must admit that he has had like experiences unless he was wiser than I and made large incisions from the first.

These experiences led me to question the merit of the small opening, but I did not fully realize the error of my ways until I had the following experience. A young man was brought to me for immediate operation with a diagnosis of acute appendicitis. He gave the history of having had a number of previous attacks, but none so severe as the present one. He had been ill but a few hours, had vomited repeatedly, and was suffering very severe pain all through the abdomen, but worse in the right iliac region. His whole abdomen was very rigid. There was marked tenderness over McBurney's point. A McBurney incision was made through which a slightly swollen and congested appendix was removed. Some serum escaped through the wound. The condition of the appendix did not seem serious enough to account for the severity of the symptoms, so a finger was passed into the opening and by forcibly depressing the abdominal walls with the knuckles a distended viscus could be felt. The original incision was closed, and a liberal median incision made through which a hand was introduced, and an intussusception of the ileum into the cecum found. The intussusception, which was caused by an inverted Meckel's diverticulum, was reduced, the diverticulum removed and the patient restored to health. The real condition here might, and ordinarily would, have been undiscovered through the short incision, and the patient would have lost his life unless subjected to a second operation very promptly. As it was, two incisions were made, whereas one of the right size and properly located would have sufficed.

The making of large incisions will not prevent oversights unless a thorough examination is made. A very common mistake made by operators is to be content when they have relieved one condition without looking for others. Even when a condition is found seemingly sufficient to account for all the symptoms, a careful search should be made for others. When one adhesive band is found there are very likely others. An appendix may be removed leaving gall-stones behind, or *vice versa*. Gall-stones may be removed from the gall-bladder and one or more left in the common duct. One typhoid perforation may be closed and others left. Since following the practice advocated in this paper my findings have been so numerous and my surprises so great that I wonder I ever had the temerity to operate through a small incision. The examination should be systematic and thorough, and the operator should never be content

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until he has found conditions that will fully account for all the symptoms. The appendiceal region, the pelvis, gall-bladder and stomach regions should always be examined as a matter of routine. Most surgical conditions will be found in these regions, but the following experience impressed on me the fact that grave conditions may be found in most obscure and unsuspected regions:

A country physician recently telephoned to me that he was sending a patient on the next morning's train for an operation for appendicitis. He said, "My diagnosis is appendicitis, but the symptoms don't check up right. Do whatever is necessary for the boy." The patient, a boy of 16, had a normal temperature, an accelerated pulse, a slightly distended abdomen, with tenderness most marked in the lower right quadrant. The most marked feature in the history was that he had been suffering for some weeks with severe cramps and occasional vomiting immediately after eating. An incision was made along the margin of the right rectus, and the appendix was found slightly congested and swollen, but in no condition to account for the symptoms. On inspection the intestines looked normal, but there was some serum present. The danger regions were all carefully examined and nothing found. Beginning at the ileocecal valve a search was made for a Lane's kink, and a small Meckel's diverticulum was found from which a long narrow band extended to a point high up and deep within the abdomen. Underneath this band was a large loop of bowel, not tightly constricted, but the lumen of the bowel was reduced about one-half. The intestine was thickened and sore at the point of constriction, showing that it had been in that position for some time. It was evident that the patient's pain after eating was due to the peristalsis set up by the food. The removal of the diverticulum and band were followed by recovery, with complete relief from pain.

The appendix is so frequently the seat of trouble that the tendency is to make a diagnosis of appendicitis on insufficient grounds. The diagnosis of appendicitis is about the easiest of all diagnoses of intra-abdominal conditions, yet the diagnosis of appendicitis is probably the most frequent wrong diagnosis made. This may be accounted for partly by the fact that appendicitis so frequently complicates other conditions; but it is doubtless due often to the natural tendency of mankind to jump at conclusions. The mistake of removing the appendix when the real cause of the patient's suffering is elsewhere can be so easily avoided by a thorough examination through an ample opening that it seems almost superfluous to argue the matter. Since adopting this method as a routine practice I have found unsuspected gall-stones, appendicitis, adhesive bands, Meckel's diverticulum, internal hernia, Lane's kink, intestinal adhesions, tuberculosis and other conditions too numerous to mention, most if not all of which could not possibly have been certainly diagnosticated by any other method.

The location of the incision is not so important as its size. When the location of the pathologic condition is not definitely known, or when it is definitely known to be in the pelvis or lower abdomen, the median incision is undoubtedly the best, as it affords easy access to all parts, and does the minimum amount of harm. In the upper abdomen the incision should be through or at the inner edge of the rectus because of the presence of the triangular ligament in the median line.

Useful and anatomically correct as the McBurney incision is, it is undoubtedly the one which is responsible for the greatest number of oversights, because it is satis-

factory only when it is made small. It can be made large, but in so doing much greater damage is done to the muscles and nerves than by a median incision, and its location is not nearly so satisfactory for general work. It is very much easier to remove an appendix through a median incision than it is to do pelvic work through a McBurney incision. The muscle-splitting incision should be restricted to cases of suppurative appendicitis in which there is no indication for going far into the abdomen, and to unmistakable cases of chronic appendicitis without complications.

In other words, the day of the short incision is past in all but exceptional cases.

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STUDIES IN INFARCTION

EXPERIMENTAL BLAND INFARCTION OF THE KIDNEY AND SPLEEN *

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The early history of the study of thrombosis and embolism is so completely reviewed in the articles of Virchow,¹ Cohn² and Welch,³ that it seems hardly necessary at this time to consume time and space with its detailed presentation. It is very evident that Galen, Vesalius, Lancisi, Bartoletti, Bonetus, Boerhave, and Morgagni had, in a general way, fairly clear ideas as to the nature of these conditions, although, as would naturally be expected, they made no sharp distinctions between the two. Laennec's description of hemorrhagic infarction of the lung, under the name of pulmonary apoplexy, was most illuminating, although he seems to have had little knowledge of the nature of infarction in general. Rokitansky⁴ had a much broader conception, but failed to differentiate the possible causes. The results of Cohn's experimental work, as well as of Pannum's,⁵ are not conclusive, in that infection and secondary inflammatory changes were almost constant complications.

In 1872 Cohnheim⁶ published his "Untersuchungen." The largest part of his work was done on the frog's tongue, but he also extended his experiments to the rabbit's ear, guinea-pig's mesentery and the mammalian kidney. He formulated the conception of end-arteries; a distinction which later observers, notably von Recklinghausen,⁷ have shown to be less absolute than Cohnheim taught. Disregarding the earlier work of Cohn and of Blesig,⁸ Cohnheim concluded from his own work

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1. Virchow, R.: *Gesammelte Abhandlungen*, Frankfurt, 1856.

2. Cohn, B.: *Klinik der embolischen Gefässkrankheiten*, Berlin, 1860.

3. Welch, Wm. H.: *Hemorrhagic Infarction*, Tr. Ass. Am. Physicians, 1887, II, 121.

4. Rokitansky: *Handbuch der pathologischen Anatomie*, Vienna, 1844, II, 60.

5. Pannum, P. J.: *Experimentelle Beiträge zur Lehre v. der Embolie*, Arch. f. path. Anat. u. Phys., 1862, xxv, 308.

6. Cohnheim, J.: *Untersuchungen über die embolischen Prozesse*, Berlin, 1872.

7. Von Recklinghausen, F.: *Handbuch der allgemeinen Pathologie des Kreislaufs*, Stuttgart, 1888, p. 150.

8. Blesig: *Ueber die Veränderung des Niere nach Unterbindung der Nierenarterie*, Arch. f. path. Anat. u. Physiol., 1850, xvi, 120.