

promptness and confidence in cases of emergency, though individual experience be wanting.

Tracheotomy is, in general, a simple operation; the division of the skin, cellular tissue, and superficial fascia is easy enough. The reaching of the median line of the trachea between the muscles alone may require caution, as bleeding and struggling will obscure the field of operation. To miss this median line and cut the muscles is embarrassing to the young surgeon. Not much difficulty is met with in incising the trachea, yet occasionally the operation may become harassing to the surgeon from the struggles of the patient, the shortness of the neck, the deep situation of the trachea in children, the convulsive paroxysms of coughing and fits of strangulation which take place on the interior of the windpipe being exposed to the external air.

Temporary strangulation, or even death, may occur at the moment when success seemed certain, from the foreign body becoming impacted in the lower portion of the tube, completely arresting the ingress of air in such circumstances. Inversion of the body, with shaking and slapping on the back, or the speedy introduction of a sound or forceps down to the bifurcation, will be the most efficient means of relief.

The after-treatment of tracheotomy must be strictly antiphlogistic, free and repeated bleeding, general or local, or both, according to circumstances, to control inflammatory tendencies, and remove congestion of the mucous membrane of the air-passages. The administration of anæsthetic agents would be, if not improper, of very doubtful propriety in the cases under consideration, as tending to shut off from the lungs the necessary supply of oxygen, already too limited, by the presence of the foreign body. Moreover, the efforts of the patient are useful, in fact needed, to expel by coughing, or snore, the substance into the opening for its removal.

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ART. VI.—*A New Method of Performing Tracheotomy, with two Illustrative Cases.* By J. H. BILL, Asst. Surg. U. S. A.

It is acknowledged by operators that tracheotomy is sometimes one of the most difficult operations in surgery, taxing the coolness, skill, and knowledge of the surgeon to the utmost extent.

The parts involved lie so deeply, are so surrounded by important vessels, are so plentifully supplied with veins, are so mobile in themselves, that even supposing perfect docility on the part of a patient, the operation may be of very difficult execution. Moreover, in no case is it an operation that can be done hastily, and at the same time with safety; and yet circumstances often demand that it should be performed without a moment's delay.

We propose in this article to offer a method to the profession which we believe greatly reduces the danger of the operation, and certainly renders its rapid performance both safe and easy.

What are the dangers attendant on tracheotomy as an operation? They are two in number. The danger of opening a great vessel at the root of the neck, and the danger of hemorrhage into the trachea from wounded tracheal or thyroid veins.

The first of these dangers may be converted into a reality by an incautious downward or lateral extension of the incision, or owing to the unsteadiness of the trachea and the slipping and rolling of this under the point of the knife. The latter accident may arise from over anxiety to open the trachea before the hemorrhage from the thyroideal and other tissues has been checked.

Feeling the necessities of the case, and the difficulties and dangers attendant upon the operation, the writer, several years since, devised a modification of the old method, and he has, by two trials on the living subject, as well as by numerous repetitions of these on the cadaver, reason to be perfectly satisfied with the operation proposed.

Fig. 1 represents the instrument employed of one-half the required size. It is, in fact, a trocar and canula of peculiar shape. The canula presents an elliptical section; the point of the trocar is shaped like the point of an ordinary curved bistoury, blunt on the back. The instrument is provided with rings at A, to serve as handles for manipulation. That portion of the rod of the trocar lying between B and C, is smaller than the rest, and has a watch-spring temper. There is a fenestra at C. The canula is silver, the trocar steel. Such is the instrument. The operation proposed is the following:—

Make an incision through the crico-thyroid membrane parallel to the crico-thyroid arteries. Having sheathed the spear point of the trocar within the canula by partly withdrawing the former from within the latter, pass the open mouth of the canula through the incision so made, and carry the instrument as far downwards as is considered safe or necessary, the convexity of course looking towards the œsophagus. When this point has been reached, depress the ring handles of the cannula towards the patient's chin. By so doing the mouth of the canula is elevated, and also

with it the anterior wall of the trachea against which it has been pressing. The great vessels are now of necessity behind and to the outside of the ordinary line of incisions; and these can be in no danger whatever when we push the handle of the trocar into its place, and so protrude the knife edge through the canula, and through all the tissues lying in front of this. The whole instrument is now to be pushed on, until the mouth of the canula has made its way through the skin, and then the stilet being withdrawn the patient is allowed to breathe temporarily through the canula by means of the fenestra at *c*. If the operation was undertaken for the removal of a foreign body, we should now proceed regularly to work as in ordinary operations, making incisions through the skin and fascia of one or two inches in length, separating the muscle and securing all tissues each side of the intended incision through the trachea, by passing underneath them bent needles, and twisting a thread over these in the manner of the interrupted suture. All this done, introduce a probe-pointed bistoury into the mouth of the canula and the lip of the incisions, through skin, fascia, and the muscles being held asunder by blunt hooks, carry canula and bistoury carefully upward until three or four tracheal rings are divided. Then remove the bistoury from the canula and withdraw this latter from the wound within the crico-thyroid membrane. The search for the foreign body may now be instituted with perfect safety.

If the operation was undertaken for another purpose than the removal of a foreign body, a different plan is recommended. After withdrawing the stilet from the canula take a tracheotomy tube that will just fit tightly in the mouth of the canula, and, having adjusted them relatively in this way, slowly withdraw the mouth of the canula through the wound, and, at the same time, push the mouth of the tracheotomy tube into its place, until this latter is fairly lodged into the trachea. Then the canula may be withdrawn through the wound in the crico-thyroid membrane. This latter method would be, perhaps, a good operation in cases requiring it from drowning, etc.

Such is the operation we propose, and which we intend in future to perform. In conclusion, we will briefly detail two cases operated upon by this principle, *i. e.*, the fixation of the trachea and the elevating it away from the great vessels before making the incisions into it.

The first case was that of private Henry, Mounted Rifles, occurring at Fort Union, during the winter of 1858.

This man was found drunk by his orderly sergeant and temporarily confined in a privy; one hour afterwards, at 6 P. M., he was discovered to be dying. He was carried to the hospital, where the steward, by dint of pounding, etc., caused the poor fellow to disgorge a bit of meat which he had vomited into his trachea or rather his larynx. I arrived as soon as possible, and found the patient perfectly comatose and pulseless. The apnoea was complete. It was so dark that I could scarcely recognize the man's features, and candles were not at hand. Feeling that no delay was

allowable, I at once plunged a common lancet into the crico-thyroid membrane, and introduced a catheter, carried its point down to the part of the trachea I wished to open, and depressing its handle I thus elevated the point of the instrument, and with it the trachea. I then plunged the lancet into the mouth of the catheter and divided all the tissues upwards by simply withdrawing the catheter and with it the lancet. The man breathed his last before the operation commenced, although every method for his recovery, including Marshall Hall's, was tried for an hour and upwards, but in vain.

I may mention, incidentally, that after making the incision in the crico-thyroid membrane and withdrawing the lancet, I was puzzled for an instant by the protrusion through the wound of a singular looking substance of the nature of a tumour. In the darkness, I guessed that it was a bit of meat, and accordingly pushed it into the gullet with my little finger before introducing the catheter. The operation did not consume more than thirty seconds time, and the autopsy next day showed that the wound in the trachea was exactly in the mesial line, and that no vessel of any size had been cut. The parts involved are now in my possession. The hemorrhage was profuse, though not more so than might have been expected considering the congestion caused by the union of drunkenness, strangulation, and the residence for an hour in the stifling atmosphere of a privy. The autopsy revealed an enormously enlarged thymus gland, weighing 210 grains. The deceased suffered from secondary syphilis and all the glands of the neck were much enlarged.

The second case occurred at Fort Defiance, N. M., in the spring of 1860. A child of a camp follower, aged 5 years, possessing a neck and disposition peculiarly unfitted for tracheotomy, had inhaled a bit of a bean or a grain of corn. She was almost suffocated, and as there were no auscultatory signs of any foreign body in the bronchi or trachea, and as there was a singular whistling noise in the larynx, I diagnosed a foreign body in the ventricles of the latter. Much to the little patient's disgust an incision was made through the skin over the crico-thyroid membrane, this latter punctured and a grooved director carried down the trachea a short distance. By depressing the handle of the grooved director the point was raised, and along with the latter the trachea, which was thus carried away from the great vessels, and fixed. As haste was no object, I carefully by regular incisions divided skin, superficial and cervical fasciæ, then separated the muscles of the trachea, and held them asunder by means of small blunt hooks, to which fine chains were attached loaded with weights, and the latter having been thrown over the edge of the table kept the trachea well exposed. I thus obviated the necessity of an assistant, who was not to be obtained. Now came the difficulty of the operation; the child was angry and frightened, and spit in my face until I was nearly blind. First, the isthmus of the thyroid was secured by two twisted sutures, in the manner of Brainard; hemorrhage thus prevented, the trachea was now well lifted away from the great vessels, and although I was nearly blind as before stated, with a feeling of delightful security I pushed a knife through the thoroughly fixed trachea, and slit upwards two or three of its rings, simply by sliding the knife along the groove of the director. This latter was then withdrawn. I then bent the scoop of the director so that it resembled the Graefe aneurism needle, and passed it into the ventricle of the larynx. In doing so, I felt something give way or slip from under the instrument. It

proved to be a grain of corn or a bean, which the child evacuated per anum thirty-six hours after, so much altered as to be unrecognizable. A small portion of the husk of the same was brought away in the scoop of the director. It was lodged in the ventricle of the larynx, and was large enough to do much harm. The patient still breathed with great difficulty from the tumefaction of the mucous membrane, and as a precautionary measure it was thought best to keep the wound open for twenty-four hours. Small doses of calomel and tartar emetic were given every two hours, the trachea was moistened every few minutes with a few drops of glycerin and fumigations of acetic acid employed. In about thirty-six hours, finding that the patient was able to breathe through the larynx, I closed the wound in the trachea by some fine wire suture, and left the patient, directing quiet and confinement for a few days. In three weeks the wound was healed, excepting a small fistulous orifice in the trachea. By frequent applications of nitrate of silver this closed also. And the patient is now, three months after the operation, quite well.

We deem that enough has been said to show

- 1st. That the method proposed is far safer than the old plan; and,
- 2d. That it may be performed more rapidly and easily.

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ART. VII.—*Case of Primary Pyæmia.* By JAMES BLAKE, M.D.,  
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THE occurrence of cases of primary pyæmia is so rare, that I think the following instance of a most acute form of the disease is worth publishing. In most systematic works on medicine, the existence of such a form of disease is not noticed. Wunderlich, however, in the *Archiv. für physiologische Heilkunde*, for 1857, relates five cases that he had met with in his extensive practice. In only one instance, however, was the disease so rapidly fatal as in the following case, and even in that it was preceded by circumstances which were much more calculated to give rise to a vitiated state of the blood. As far as my knowledge of medical literature enables me to judge, the accompanying case is unique in the apparent absence of all those antecedents which have generally been regarded as essential to the development of the disease.

G. L., æt. 14, a strong, healthy boy; has always enjoyed good health, having even escaped up to the present time all the infantile, eruptive fevers and whooping cough, although frequently exposed to them. On July 23d, whilst playing, and on the ground, he received a kick in the thigh from one of his school-fellows. The kick caused him some pain, so that he sat down for about half an hour. He did not complain on returning home, and the next day he went to school as usual, walking a considerable distance; but on coming home in the evening he was lame, and complained